

L Number	Hits	Search Text	DB	Time stamp
1	81	trans adj2 free and (fat or oil or triglyceride)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM TDB	2002/02/21 09:43
2	33	(trans adj2 free and (fat or oil or triglyceride)) and (spread or margarine)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM TDB	2002/02/21 09:44
3	1437	fractionated and (palm or palm adj kernel)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM TDB	2002/02/21 09:45
4	19	((trans adj2 free and (fat or oil or triglyceride)) and (spread or margarine)) and (fractionated and (palm or palm adj kernel))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM TDB	2002/02/21 09:45

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NEWS	1		Web Page URLs for STN Seminar Schedule - N. America
NEWS	2	Sep 17	IMSworld Pharmaceutical Company Directory name change to PHARMASEARCH
NEWS	3	Oct 09	Korean abstracts now included in Derwent World Patents Index
NEWS	4	Oct 09	Number of Derwent World Patents Index updates increased
NEWS	5	Oct 15	Calculated properties now in the REGISTRY/ZREGISTRY File
NEWS	6	Oct 22	Over 1 million reactions added to CASREACT
NEWS	7	Oct 22	DGENE GETSIM has been improved
NEWS	8	Oct 29	AAASD no longer available
NEWS	9	Nov 19	New Search Capabilities USPATFULL and USPAT2
NEWS	10	Nov 19	TOXCENTER(SM) - new toxicology file now available on STN
NEWS	11	Nov 29	COPPERLIT now available on STN
NEWS	12	Nov 29	DWPI revisions to NTIS and US Provisional Numbers
NEWS	13	Nov 30	Files VETU and VETB to have open access
NEWS	14	Dec 10	WPINDEX/WPIDS/WPIX New and Revised Manual Codes for 2002
NEWS	15	Dec 10	DGENE BLAST Homology Search
NEWS	16	Dec 17	WELDASEARCH now available on STN
NEWS	17	Dec 17	STANDARDS now available on STN
NEWS	18	Dec 17	New fields for DPCI
NEWS	19	Dec 19	CAS Roles modified
NEWS	20	Dec 19	1907-1946 data and page images added to CA and CPlus
NEWS	21	Jan 25	BLAST(R) searching in REGISTRY available in STN on the Web
NEWS	22	Jan 25	Searching with the P indicator for Preparations
NEWS	23	Jan 29	FSTA has been reloaded and moves to weekly updates
NEWS	24	Feb 01	DKILIT now produced by FIZ Karlsruhe and has a new update frequency
NEWS	25	Feb 19	Access via Tymnet and SprintNet Eliminated Effective 3/31/02
NEWS EXPRESS			February 1 CURRENT WINDOWS VERSION IS V6.0d, CURRENT MACINTOSH VERSION IS V6.0a(ENG) AND V6.0Ja(JP), AND CURRENT DISCOVER FILE IS DATED 05 FEBRUARY 2002
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FILE 'HOME' ENTERED AT 09:58:02 ON 21 FEB 2002

=> s (oil or spread or blend) and trans  
THIS COMMAND NOT AVAILABLE IN THE CURRENT FILE  
Some commands only work in certain files. For example, the EXPAND  
command can only be used to look at the index in a file which has an  
index. Enter "HELP COMMANDS" at an arrow prompt (=>) for a list of  
commands which can be used in this file.

=> file fsta  
COST IN U.S. DOLLARS

SINCE FILE  
ENTRY  
0.15

TOTAL  
SESSION  
0.15

FULL ESTIMATED COST

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<<< FSTA HAS BEEN RELOADED AND MOVES TO WEEKLY UPDATES.  
SEE NEWS 41 <<<

=> s (oil or spread or blend) and trans  
35929 OIL  
2406 SPREAD  
2373 BLEND  
3440 TRANS  
L1 990 (OIL OR SPREAD OR BLEND) AND TRANS

=> s palm or lauric(w) fat  
3077 PALM  
749 LAURIC  
53123 FAT  
22 LAURIC(W) FAT  
L2 3089 PALM OR LAURIC(W) FAT

=> s sunflower or canola or soy or pea or rice(w) bran or olive or safflower or corn  
or marine

4746 SUNFLOWER  
746 CANOLA  
12960 SOY  
2429 PEA  
12420 RICE  
3984 BRAN  
1140 RICE(W) BRAN  
3786 OLIVE  
953 SAFFLOWER  
16295 CORN  
2923 MARINE  
L3 42318 SUNFLOWER OR CANOLA OR SOY OR PEA OR RICE(W) BRAN OR OLIVE OR  
SAFFLOWER OR CORN OR MARINE

=> s 11 and 12 and 13  
L4 34 L1 AND L2 AND L3

=> d 14 all 1-34

L4 ANSWER 1 OF 34 FSTA COPYRIGHT 2002 IFIS

- AN 2002:N0048 FSTA  
 TI Determination of **trans** octadecenoic acids by silver-ion chromatography-gas liquid chromatography: an intercomparison of methods.  
 AU Buchgraber, M.; Ulberth, F.  
 CS Correspondence (Reprint) address, F. Ulberth, Dep. of Dairy Res. & Bacteriol., Univ. of Agric. Sci., A-1180 Vienna, Austria  
 SO Journal of AOAC International, (2001), 84 (5) 1490-1498, 24 ref.  
 ISSN: 1060-3271  
 DT Journal  
 LA English  
 AB Several silver-ion (Ag) chromatography-gas liquid chromatography (GLC) techniques for the determination of **trans** octadecenoic acids in partially hydrogenated vegetable fats were collaboratively evaluated. 12 laboratories participated in the study. All collaborators used high polarity fused silica capillary columns for the separation of fatty acid methyl esters by GLC; 7 collaborators isolated **trans** monoenes by Ag-LC and the remainder used Ag-TLC. 8 artificially prepared materials (soybean oil spiked with either elaidate, trielaidin, or **trans** octadecenoates isolated from partially hydrogenated **sunflower oil** (PHSO)) and 2 matrix materials (PHSO and a blend of PHSO and **palm oil**) served as test samples. Ag-TLC and Ag-LC proved to be equivalent techniques for the prefractionation of **trans** monoenes. Recovery of methyl elaidate, trielaidin, or **trans** octadecenoates isolated from PHSO varied between 97.9 and 103.7% over a concn. range of 1 to 30 g **trans** fatty acids/100 g. Reproducibility relative s.d. (RSD.sub.R) for the spiked samples were in the range of 3.1-8.6% for 30-18 **trans** monoene content. For the 2 matrix samples (mean 3.75 and 19.08% **trans** monoene content) RSD.sub.R was 13.2 and 3.6%. The hyphenated techniques tested proved to be highly accurate, reproducible and sufficiently precise methods for the determination of **trans** monoenes in partially hydrogenated vegetable fats. It is concluded that Ag chromatography is a robust method which does not need rigorous standardization to achieve high precision of test results. A further benefit of the hyphenated technique is that any type of efficient polar capillary column can be used.  
 CC N (Fats, Oils and Margarine)  
 CT HIGH PERFORMANCE LIQUID CHROMATOGRAPHY; MINERALS; OILS VEGETABLE; OLEIC ACID; THIN LAYER CHROMATOGRAPHY; AG; LIQUID CHROMATOGRAPHY; OCTADECENOIC ACID; TLC; VEGETABLE OILS
- L4 ANSWER 2 OF 34 FSTA COPYRIGHT 2002 IFIS  
 AN 2001(08):N0622 FSTA  
 TI General properties of margarine, cooking oil and confectionery on the market in Czech, Hungary, and Poland.  
 AU Matsuzaki, H.; Aoyama, M.; Maruyama, T.; Niiya, I.  
 CS Japan Inst. of Oils & Fats, 3-27-8, Nihonbashi-Hamacho, Chuo-ku, Tokyo 103-0007, Japan  
 SO Journal of Oleo Science, (2001), 50 (1) 65-72, 23 ref.  
 ISSN: 1345-8957  
 DT Journal  
 LA Japanese  
 SL English  
 AB Lipid components of margarine (36 brands), cooking oil (46 brands) and confectionery (23 brands) used in the Czech Republic, Hungary and Poland, were investigated. Lipid and energy contents of margarine ranged from 24.4-79.9% and 26-738 kcal/100 g, respectively. Many products were low in both fat and energy content. Lipid contents of biscuits and cookies were 8.0-27.1 and 23.5-27.2%, respectively. Tocotrienol levels of >1 mg/100 g were detected in 6/10, 6/8 and 6/18 brands of margarine from the Czech Republic, Hungary and Poland, respectively, suggesting the presence of **palm oil** in

these products. Many products contained **brassicasterol**, which is characteristic of rapeseed **oil**, while several products contained **.DELTA..sup.7 stigmasterol**, suggesting the presence of **sunflower** or **safflower oil**. **C12** fatty acids, indicative of coconut or **palm kernel oil**, were present at high levels in many products from Hungary and the Czech Republic. Mean **trans** fatty acid content of margarine from the Czech Republic, Hungary and Poland was 7.1, 3.1 and 17%, respectively. It is concluded that only small amounts of hydrogenated **oil** are used to prepare margarines in the Czech Republic and Hungary, but that more significant amounts are used in the preparation of confectionery products.

CC N (Fats, Oils and Margarine)  
CT BISCUITS; LIPIDS; MARGARINES; OILS; COOKING OILS; CZECH REPUBLIC; HUNGARY; POLAND

L4 ANSWER 3 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 2001(05):P0792 FSTA

TI Effect of lecithins partly replacing rumen-protected fat on fatty acid digestion and composition of cow milk.

AU Wettstein, H. R.; Scheeder, M. R. L.; Sutter, F.; Kreuzer, M.

CS Inst. of Animal Sci., ETH Zurich, ETH-Zentrum/LFW B56, CH-8092, Zurich, Switzerland. Tel. +41-1-632-5972. Fax +41-1-632-1128. E-mail michael.kreuzer(a)inw.agrl.ethz.ch

SO European Journal of Lipid Science and Technology, (2001), 103 (1) 12-22, 39 ref.

ISSN: 1438-7697

DT Journal

LA English

AB Lecithins are used in feeds of dairy cows to replace rumen-protected fats such as calcium soaps. Effects of supplementing 25% of calcium soaps with a range of raw and processed plant lecithins on the digestibility of calcium soaps of **palm oil** and the fatty acid composition of milk fat were investigated. Partial replacement of soaps by **soy** or rapeseed lecithins and soybean **oil** had small but significant effects on fatty acid digestion and utilization, as well as on the fatty acid profile of the milk. Compared with using calcium soaps alone, **C16:0** digestibility was higher with lecithins and percentage of **CLA** and **trans C18:1** in milk fat increased whereas **C16:0** decreased. De-oiling of lecithins reduced the effects on **C16:0** digestibility and excretion in milk slightly. Differences between raw and processed lecithins were greater than between raw **soy** and raw rapeseed lecithin.

CC P (Milk and Dairy Products)

CT FATS MILK; FATTY ACIDS; FEEDS; MILK; MILK FATS

L4 ANSWER 4 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 2000(12):J2652 FSTA

TI Fatty acid composition and **trans**-oleic acid percentage in some brands of chip potato by capillary gas chromatography.

AU Santana, D. M. N.; Marques, M. M.; Rosa, C. A. R.

CS Dep. de Tec. de Alimentos, IT/UFRRJ, Seropedica, RJ, Brazil. E-mail djalva(a)rural.com.br

SO Boletim da Sociedade Brasileira de Ciencia e Tecnologia de Alimentos, (1999), 33 (1) 64-69, 16 ref.

ISSN: 0101-3637

DT Journal

LA Portuguese

SL English

AB Samples of potato crisps of 5 brands were analysed by GC for fatty acid composition and content of **trans**-fatty acids. Total fat content was also determined. The potato crisps contained 35.35-39.48% fat. Fatty acid composition data showed that the main frying oils used were

**palm oil**, or partially hydrogenated soybean or **canola** oils. **Trans**-fatty acid concn. in the crisps ranged from 3.38 to 21.12%; this corresponds to an intake of 1.5-7.93 g **trans**-fatty acids/g potato crisps. It is suggested that, because of health concerns about **trans**-fatty acids, it would be desirable if potato crisp manufacturers changed to frying in natural rather than hydrogenated fats.

CC J (Fruits, Vegetables and Nuts)  
CT CHIPS; FATS; FATTY ACIDS; FOOD SAFETY PLANT FOODS; FRYING FATS; POTATO CRISPS; **TRANS FATTY ACIDS**

L4 ANSWER 5 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 2000(11):M1391 FSTA  
TI A biscuit a day keeps the doctor away.  
AU Anon.  
SO Food Review, (2000), 27 (6) 47  
ISSN: 0257-8867

DT Journal  
LA English

AB A nutritional biscuit, known as the Carotino Nutritional Biscuit, which has been developed by the South African Medical Research Council to help solve the problem of micronutrient deficiency is discussed. Initially, the biscuit was made with hydrogenated **marine oil** as baking fat, with .beta.-carotene and antioxidants added in powder form. Although this biscuit was successful at increasing vitamin A and Fe levels in children, improving their school performance and reducing absenteeism, quality control was difficult. Hence, red **palm fat** (commercially known as Carotino) was used to replace the shortening. Red **palm fat** is non-hydrogenated, contains no **trans** fatty acids, and is a rich source of .beta.-carotene and antioxidants, including vitamin E. Biscuits baked using Carotino have a shelf life .gtoreq.6 months and have the nutritional benefits of the original biscuit.

CC M (Cereals and Bakery Products)  
CT ANTIOXIDANTS; BISCUITS; CAROTENES; FATS VEGETABLE; NUTRIENTS; Nb -CAROTENE; **RED PALM FATS**  
TN Carotino

L4 ANSWER 6 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1999(08):N0407 FSTA  
TI Physicochemical characteristics of **palm-based oil**

blends for the production of reduced fat spreads.

AU Habi Mat Dian Noor Lida; Rahim Md Ali, A.  
CS Palm Oil Res. Inst. of Malaysia, Min. of Primary Ind., No. 6, Persiaran Institusi, 43000 Kajang, Selangor, Malaysia. E-mail nlida(a)porim.gov.my  
SO Journal of the American Oil Chemists' Society, (1998), 75 (11) 1625-1631, 14 ref.

ISSN: 0003-021X  
DT Journal

LA English

AB Effects of blending and interesterification on physicochemical properties of fat blends containing **palm oil** products were studied. Characteristics of the **palm**-based blends were tailored to resemble **oil** blends extracted from commercial reduced fat spreads (RFS). The commercial products contained .ltoreq.20.4% **trans** fatty acids, whereas the **palm**-based blends were free of **trans** fatty acids. Slip m.p. of the blends varied from 26.0 to 32.0.degree.C for tub RFS and from 30.0 to 33.0.degree.C for block RFS. Solid fat content at 5 and 10.degree.C (refrigeration temp.), respectively, varied from 10.9 to 19.7 and 8.5 to 17.6% for tub RFS, and from 28.2 to 36.6 and 20.8 to 33.5% for block RFS. Melting enthalpy of the tub RFS varied from 35.0 to 54.3 J/g and that of block RFS varied from 58.0 to 75.4 J/g. To produce block RFS, 65% **palm oil**

(PO) and 18% **palm** kernel olein (PKOo) could be added in a ternary **blend** with **sunflower oil** (SFO), but only 47% PO and 10% PKOo were recommended for tub RFS. Higher proportions of PO, i.e. 72% for block RFS and 65% for tub RFS, could be used after the ternary **blend** was interesterified. Although a ternary **blend** of **palm** olein (POo)/SFO/PKOo was not suitable for RFS formulation, after interesterification as much as 90% POo and 26% PKOo could be used in the block RFS formulation. For tub RFS, a max. of 30% POo was found to be suitable.

CC N (Fats, Oils and Margarine)  
CT ESTERIFICATION; FATS; MIXING; **PALM OILS**; PHYSICAL PROPERTIES;  
SPREADS; BLENDING; FATS LOW SPREADS; INTERESTERIFICATION; PHYSICOCHEMICAL PROPERTIES

L4 ANSWER 7 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1999(06):J1361 FSTA

TI Key odorants of French fries.

AU Wagner, R. K.; Grosch, W.

CS Correspondence (Reprint) address, W. Grosch, Deutsche Forschungsanstalt fuer Lebensmittelchem, Lichtenbergstr. 4, D-85748 Garching, Germany.

E-mail LEBCHEM.Grosch(a)lrz.tu-muenchen.de

SO Journal of the American Oil Chemists' Society, (1998), 75 (10) 1385-1392, 38 ref.

ISSN: 0003-021X

DT Journal

LA English

AB Twenty-one compounds, which had been screened in preceding experiments as potent odorants [aroma compounds] of French fries prepared in **palm oil** (PO), were quantified by stable isotope dilution assays. 19 odorants [with odour qualities corresponding to the notes of the PO flavour profile] were dissolved in **sunflower oil** in concn. equal to those in PO. The flavour profile of the model thus obtained was close to that of a real sample of PO. A comparison of the complete model with models lacking 1 or more compounds indicated that the following compounds were key odorants of PO: 2-ethyl-3,5-dimethylpyrazine, 3-ethyl-2,5-dimethylpyrazine, 2,3-diethyl-5-methylpyrazine, 3-isobutyl-2-methoxypyrazine, (E,Z)- and (E,E)-2,4-decadienal, **trans**-4,5-epoxy-(E)-2 decenal, 4-hydroxy-2,5-dimethyl-3(2H)-furanone, methylpropanal, 2- and 3-methylbutanal, and methanethiol. Replacement of **palm oil** by coconut fat led to a coconut note in the profile of French fries. .gamma.-Octalactone was identified as a major contributor to this note.

CC J (Fruits, Vegetables and Nuts)

CT AROMA COMPOUNDS; CHIPS; **PALM OILS**; POTATOES; FRENCH FRIES;  
MODELLING

L4 ANSWER 8 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1998(08):N0361 FSTA

TI The interesterification-induced changes in **olive** and **palm oil** blends.

AU Alpaslan, M.; Karaali, A.

CS Dep. of Food Eng., Tekirdag Univ., Tekirdag, Turkey

SO Food Chemistry, (1998), 61 (3) 301-305, 14 ref.

ISSN: 0308-8146

DT Journal

LA English

AB Refined **olive oil** (which has highly desirable nutritional attributes) and partially hydrogenated **palm oil** (PHPO) blended in various proportions were interesterified both chemically and enzymically with the aim of producing fats with similar properties to those of commercial margarines sold in Turkey. The m.p., solid fat content at various temp., fatty acid composition and

**trans** fatty acid isomer contents were examined in the rearranged fats. In addition, spreadability and appearance of the fats were examined by a sensory panel and results compared with those obtained for commercial samples of Turkish margarines. Enzymic interesterification of a 30:70 **olive oil-PHPO blend** produced a fat with properties which were very similar to existing commercial margarines but with the advantage of having an increased monounsaturated fatty acid content.

CC N (Fats, Oils and Margarine)

CT ESTERIFICATION; **OLIVE OILS; PALM OILS**; PHYSICAL PROPERTIES; SENSORY PROPERTIES; INTERESTERIFICATION; PHYSICOCHEMICAL PROPERTIES

L4 ANSWER 9 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1998(08):N0358 FSTA

TI Modulation of human lipids and lipoproteins by dietary **palm oil** and **palm olein**: a review.

AU Kalyana Sundram

CS Palm Oil Res. Inst. of Malaysia, PO Box 10620, 50720 Kuala Lumpur, Malaysia. Fax +60-3-8259446. E-mail kalyana(a)porim.gov.my

SO Asia Pacific Journal of Clinical Nutrition, (1997), 6 (1) 12-16, 32 ref. ISSN: 0964-7058

DT General Review

LA English

SL Chinese

AB Several human clinical trials have now evaluated **palm oil**'s effects on blood lipids and lipoproteins. These studies suggest that **palm oil** and **palm olein** diets do not raise plasma TC [total cholesterol] and LDL [low density lipoprotein]-cholesterol levels to the extent expected from its fatty acid composition. With max. substitution of **palm oil** in a Western type diet some coronary heart disease risk factors were beneficially modulated: HDL2 [high density lipoprotein 2]-cholesterol was significantly increased while the apolipoprotein B:A1 ratio was beneficially lowered by **palm oil**. Comparison of **palm olein** with a variety of monounsaturated edible oils including rapeseed and **olive** oils has shown that plasma and LDL-cholesterol were not elevated by **palm olein**. To focus these findings, specific fatty acid effects have been evaluated. Myristic acid may be the most potent cholesterol raising saturated fatty acid. Palmitic acid effects were largely comparable to the monounsaturated oleic acid in normolipidaemic subjects while **trans** fatty acids detrimentally increased plasma cholesterol, LDL-cholesterol, lipoprotein Lp(a) and lowered the beneficial HDL-cholesterol. Apart from these fatty acids, there is evidence that the tocotrienols in **palm oil** products may have a hypocholesterolaemic effect. This is mediated by the ability of the tocotrienols to suppress HMG-CoA [3-hydroxy-3-methylglutaryl coenzyme A] reductase. These new findings on **palm oil** merit a scientific reexamination of the classical saturated fat-lipid hypothesis and its role in lipoprotein regulation.

CC N (Fats, Oils and Margarine)

CT LIPIDS; **PALM OILS**; REVIEWS

L4 ANSWER 10 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1998(05):N0176 FSTA

TI Fats and oils: health vs. functionality.

AU Deis, R. C.

SO Food Product Design, (1997), 7 (8) 29-30, 32, 34, 38-39, 43-44, 47, 50, 52, 54-55, 45 ref. ISSN: 1065-772X

DT Journal

LA English

AB Use of fats and oils in foods in the USA is discussed with particular reference to their health and functional properties. Aspects considered include: US current government guidelines on fat consumption; advantageous properties that fats may confer upon foods (heat transfer media, textural qualities, lubrication of food, contribution to mouthfeel and flavour and enhancement of appearance); chemical composition of saturated and unsaturated fats; effects of the degree of unsaturation on the properties of a fat; classification and characteristics of vegetable oils (soybean oil, canola oil, cottonseed oil, peanut oil, sunflower oil, corn oil, palm oil and coconut oil); methods of increasing functionality of oils without negatively affecting beneficial health effects (hydrogenation, interesterification); problems associated with occurrence of **trans** fatty acids in fats and oils; use of genetic engineering techniques to modify properties and composition of oils; development and applications of Salatrim; chemical structure and properties of .omega.-3 polyunsaturated fatty acids and their apparent health benefits; and future considerations affecting development of fats and oils in the USA.

CC N (Fats, Oils and Margarine)  
CT FATS; OILS; FOODS; UNITED STATES OF AMERICA

L4 ANSWER 11 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1997(12):J0161 FSTA

TI Industrial production of crisps and prefried french fries using **sunflower** oils.

AU Sebedio, J. L.; Dobarganes, M. C.; Marquez, G.; Wester, I.; Christie, W. W.; Dobson, G.; Zwobada, F.; Chardigny, J. M.; Mairot, T.; Lahtinen, R.

CS Unite de Nutr. Lipidique, INRA, Dijon, France

SO Grasas y Aceites, (1996), 47 (1/2) 5-13, 47 ref.  
ISSN: 0017-3495

DT Journal

LA English

AB Crisps and pre-fried French fries were prepared during industrial operations in order to study the possibility of using normal and high oleic **sunflower** oils instead of **palm** olein and mixtures of partially hydrogenated vegetable oils and **palm** oil in industrial frying. Quality of the foods was evaluated by determining the total amount of polar components, amounts of the different components in the polar fraction (dimers, oxidized triglycerides, diglycerides), the quantity of cyclic fatty acid monomers (CFAM) as well as the 18:2 geometrical fatty acid isomers. For production of both crisps and French fries, a very small increase in polar components was observed. Frying of crisps did not result in any changes in fatty acid composition nor in the amount of 18:2 geometrical isomers. However, the amount of CFAM increased in samples fried in **sunflower** oil. An increase in CFAM was also observed for French fries independent of the frying medium used. No modifications of the **cis** and **trans** isomer distributions were observed for the French fries prepared in the mixture of **palm** oil and partially hydrogenated rapeseed oil (**canola**). These results show that **sunflower** oils could be used for the industrial production of French fries and crisps. Storage studies are being carried out to determine whether both types of **sunflower** oils give products which are as stable as those prepared in a solid frying medium.

CC J (Fruits, Vegetables and Nuts)

CT CHIPS; COOKING; FRYING; OILS; POTATOES; PROCESSED FOODS; **SUNFLOWER** OILS; VEGETABLES SPECIFIC; DEEP FRYING; FRENCH FRIES; POTATO CRISPS

L4 ANSWER 12 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1997(01):N0043 FSTA

TI Improved deodorising technology from Alfa Laval.

AU Stenberg, O.  
 CS Alfa Laval Separation AB, S-147 80 Tumba, Sweden. Tel. +46-8-530-65000.  
 Fax +46-8-530-39582  
 SO Lipid Technology, (1996), 8 (5) 105-106  
 ISSN: 0956-666X  
 DT Journal  
 LA English  
 AB Latest developments in SoftColumn deodorizer technology from Alfa Laval are discussed, which extend the technique from **palm oil** to seed oils. Consideration is given to deodorizer design and operation, and to the establishment of the technology at a factory producing cooking (particularly **sunflower** seed) oils in Turkey. It is claimed that the technology can limit vacuum-raising costs, minimize the formation of **trans** fatty acids and retain a high proportion of original tocopherol antioxidants.

CC N (Fats, Oils and Margarine)  
 CT DEODORIZATION; EQUIPMENT; OILS; OILS VEGETABLE; PROCESSING; VEGETABLE PRODUCTS; VEGETABLE OILS

L4 ANSWER 13 OF 34 FSTA COPYRIGHT 2002 IFIS  
 AN 1996(10):N0023 FSTA  
 TI Commercial frying fats and plasma lipid-lowering potential.  
 AU Noakes, M.; Nestel, P. J.; Clifton, P. M.  
 CS CSIRO Div. of Human Nutr., PO Box 10041 Gouger St., Adelaide, SA 5000, Australia  
 SO Australian Journal of Nutrition and Dietetics, (1996), 53 (1) 25-30, 33 ref.  
 ISSN: 1032-1322  
 DT Journal  
 LA English  
 AB Effects on plasma cholesterol levels of 3 types of cooking fats suitable for frying were compared. 23 hypercholesterolaemic men and women participated in a double blind, cross-over trial using: **palm oil**, a commonly used solid frying fat (51% saturated, 38% cis-monounsaturated, 10% polyunsaturated); a high oleic genetic variant of **sunflower oil** (HOSO, 7% saturated, 89% cis-monounsaturated, 4% polyunsaturated); and, a test **blend**, a newly developed semi-solid **blend** with moderate **trans** fatty acids (TFA) but designed to have lipid-lowering potential (15% saturated, 56% cis-monounsaturated, 20% **trans**, 9% polyunsaturated). The cooking fats provided 20% of energy in a diet containing 35% fat energy. **Palm oil** resulted in the highest plasma low density lipoprotein (LDL) cholesterol concn. (4.18  $\pm$  0.81 mmol/l) which was significantly different ( $P < 0.001$ ) from HOSO (3.77  $\pm$  0.58 mmol/l) and the test **blend** (3.88  $\pm$  0.70 mmol/l). High density lipoprotein (HDL) cholesterol was also highest on **palm oil** (1.25  $\pm$  0.33 mmol/l) which was significantly different ( $P < 0.001$ ) from the test **blend** (1.18  $\pm$  0.3 mmol/l) and HOSO (1.22  $\pm$  0.32 mmol/l). The lowest HDL levels were seen with the test **blend**, in keeping with its TFA content, resulting in an LDL:HDL ratio similar to that produced by **palm oil**. Plasma triglyceride was lowest when subjects were taking HOSO (1.66  $\pm$  0.70 mmol/l) and significantly different ( $P < 0.05$ ) from the test **blend** (1.86  $\pm$  0.84 mmol/l). It is concluded that HOSO is preferable to **palm oil** in terms of lipid lowering for hypercholesterolaemic individuals. Further, it is possible to design formulations with modified fat blends, such as the test **blend** used in this study, which is partially solid by virtue of hydrogenation yet suitable for frying and inducing a lower plasma LDL cholesterol.

CC N (Fats, Oils and Margarine)  
 CT ALCOHOLS; CHOLESTEROL; FATS; LIPIDS; FRYING FATS

L4 ANSWER 14 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1996(10):J0090 FSTA

TI High-oleic **sunflower** oils are good for frying.  
CS Flair-Flow Europe; Correspondence address, J. L. Sebedio, Unite de Nutr.  
Lipidique, INRA, 17 Rue Sully, 21034 Dijon, France. Tel. +33-80-63-31-23.  
Fax +33-80-63-32-23

SO Flair-Flow Reports, (1996), F-FE 217/96, 1p.

DT Journal

LA English

AB Progress is described in the ongoing EU AAIR project set up to investigate the safety of using **sunflower oil** and high-oleic **sunflower oil** in industrial frying operations as alternatives to **palm oil** and partially hydrogenated oils. 34 t of crisps and 200 t of French fries were produced; product quality was evaluated by chemical analyses, sensory analysis and nutritional studies. No noticeable changes in triacylglycerol levels during frying were found, and the amount of polar compounds formed was well below the prescribed limit of 25%. Frying did not increase the content of **trans** isomers of linoleic acid which were already present in the refined oils. The quantity of cyclic fatty acid monomers increased only slightly. Only minor amounts of phytosterol oxides were found in the products. Stability of crisps and French fries during storage at ambient temp. and -18.degree.C, respectively, was also studied. After storage for 2 yr, little oxidation was evident in French fries. Peroxide value of the lipids extracted from crisps prepared using **sunflower oil** increased sharply after 4 wk of storage, while those fried in high-oleic **sunflower oil** or **palm oil** showed very little increase in peroxide value; a similar trend was observed for oxidized triglycerides. Sensory analyses showed that crisps fried in **sunflower oil** were rancid after 17 wk, whereas those prepared using high-oleic **sunflower oil** or **palm oil** were still excellent after 27 wk. For French fries, no oil-related deterioration in sensory properties was evident during the 19-month storage period. [See also FSTA (1995) 27 4N56 for previous update of this project.]

CC J (Fruits, Vegetables and Nuts)

CT CHIPS; LIPIDS; OILS; POTATOES; PROCESSED FOODS; VEGETABLES SPECIFIC;  
FRENCH FRIES; FRYING OILS; POTATO CRISPS; REPORT

L4 ANSWER 15 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1996(09):N0010 FSTA

TI Fats, oils, and fat replacers.

AU Giese, J.

SO Food Technology, (1996), 50 (4) 77-83, 16 ref.  
ISSN: 0015-6639

DT Journal

LA English

AB Fats, oils and fat replacers are discussed. Aspects considered include: per capita consumption of fats in the USA (60.4-65.0 lb/yr); sensory properties of fats and oils in foods; functional properties of fats and oils; nutritional values of fats; composition of fats; hydrogenation of oils; fat and oil products (cooking oils and salad oils from soybean, cottonseed, **corn**, peanut, **olive**, rapeseed, **safflower** and **sunflower**); tropical fats and oils (cocoa butter, coconut oil, **palm oil** and **palm kernel oil**); animal fats (lard and tallow); shortenings; margarines; non-dairy creamers; nutritional and health aspects (fat intake and obesity and heart disease, and effects of **trans** fatty acids on plasma cholesterol); fat replacers (gums, pectin, cellulose, starches from **corn**, tapioca, potato and rice, oat-based fat replacers, maltodextrins, polydextrose, dried fruit-based fat replacers, protein-based fat replacers, whey protein concentrates, and

isolated **soy** protein, microparticulated protein, common emulsifiers, lipid analogues (salatrim, caprenin and olestra)), and the future for fat reduction of foods.

CC N (Fats, Oils and Margarine)  
CT FAT SUBSTITUTES; FATS; LIPIDS

L4 ANSWER 16 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1995(04):N0056 FSTA

TI Evaluating **olive** and **sunflower** oils. II.

CS **Sunflower** oils in industrial frying (AAIR 0687).  
Flair-Flow Europe; Correspondence address, J. L. Sebedio, INRA, Sta. de  
Recherches sur la Qualite des Aliments de l'Homme, Unite de Nutr.  
Lipidique, 17-Rue Sully, 21034 Dijon, France. Tel. 80 63 31 10. Fax 80 63  
32 23

SO Flair-Flow Reports, (1995), F-Fe 155/95, 1p.

DT Report

LA English

AB Use of **sunflower** oils in industrial frying operations was  
studied within the framework of the AAIR programme. Industrial frying is  
usually carried out using **palm oil** and/or partially  
hydrogenated oils; however, these oils produce fried foods with a high  
**trans** fatty acid content. Monounsaturated fatty acids (MUFA) do  
not have the adverse cholesterol effects associated with **trans**  
fatty acids, therefore **sunflower oil** and high oleic  
acid **sunflower** oils were assessed in industrial frying tests  
using crisps as a model food. Results indicated that crisps fried in these  
oils were of good quality; however, **sunflower-oil**  
-fried crisps became rancid between wk 11 and 16 of storage. In contrast,  
quality of samples prepared using high oleic acid **sunflower** oils  
was rated more highly. [See preceding abstr. for part I.]

CC N (Fats, Oils and Margarine)  
CT COOKING; FRYING; OILS; **SUNFLOWER OILS**; VEGETABLE PRODUCTS;  
REPORT

L4 ANSWER 17 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1995(04):N0028 FSTA

TI Margarine oils, blends in Canada.

AU Mag, T. K.

CS 35 Old Church Rd, RR 2, King City, Ont. L0G 1K0, Canada

SO INFORM, (1994), 5 (12) 1350-1353

ISSN: 0897-8026

DT Journal

LA English

AB Aspects of the margarine industry in Canada are considered, including  
consumption patterns and prices, oils used, **oil** blends and their  
properties, and regulatory aspects. During 1990-1991, consumption of  
margarine increased and that of butter decreased, but this trend has since  
been reversed. In 1991 (the latest yr for which complete statistics are  
available), per capita consumption of margarine, butter and shortening,  
respectively, was 5.76, 3.10 and 9.42 kg/yr. Since 1988 there has been a  
steady increase in the proportion of soft margarine consumed vs. hard  
margarine; in 1992 soft margarine amounted to 69.2% of the total. Low  
calorie products (low fat spreads and diet margarines containing approx.  
40% fat) amounted to 4.4% of the market. Oils used in Canadian margarines  
are (approx. percentages): soybean, 36%; rapeseed, 36%; **sunflower**  
, 8%; **palm**, 5%; **corn**, 5%; cottonseed, 5%; and  
**palm** kernel and coconut, 5%. The 3 main types of margarine on the  
market are hard, soft, and low-**trans** soft; it is suggested that  
the market share for each of these types will depend partially on the  
intensity of the debate on **trans** fatty acids.

CC N (Fats, Oils and Margarine)  
CT CONSUMPTION; ECONOMICS; FATS; MARGARINES; CANADA; INDUSTRIES

L4 ANSWER 18 OF 34 FSTA COPYRIGHT 2002 IFIS  
 AN 1994(10):N0008 FSTA  
 TI **Trans**-fatty acid contents of various foods cooked with oils and fats in Japan.  
 AU Okamoto, T.; Kinoshita, Y.; Kanematsu, H.; Niiya, I.; Sugano, M.  
 CS Japan Inst. of Oils & Fats, Other Foods Inspection Foundation, 3-27-8, Nihonbashi-Hamacho, Chuo-ku, Tokyo 103, Japan  
 SO Journal of the Japan Oil Chemists' Society, (1993), 42 (12) 996-1002, 14 ref.  
 ISSN: 0513-398X  
 DT Journal  
 LA Japanese  
 SL English  
 AB **Trans**-fatty acids contents of foods cooked in oils and fats in Japan were determined. Foods studied included bakery products, cereals, potato chips, rice and **corn** snack foods, French fries, fried chicken, fried fish, shrimp and starch-containing snacks, fried squid snacks and Indian lotus root chips. **Trans**-fatty acids were detected in all foods, but at levels of <15% for most samples. Fatty acids analysis indicated that a **blend** of unhydrogenated oil and hydrogenated fat was used to cook the foods. Tocotrienols content (mainly .gamma.-tocotrienols) indicated that 43 food samples were cooked with a **blend** of **palm oil**. Hydrogenated fish oil was detected in 1 doughnut. Some samples of doughnuts and French fries contained >30% **trans**- fatty acids. **Trans**-fatty acids intake from the foods was calculated as 0.1-7.7 g/1-2 small doughnuts; 0.1-0.5 g/100 g for potato chips; 0.1-2.9 g/packet of cereal; 0.1/4.6 g/serving of French fries; and 0.1-0.5 g/serving of fried chicken and fish. Total **trans**-fatty acids intake was estimated as approx. 1.8 g/capita/day in Japan, significantly lower than the American figure of 13.3 g/capita/day. [From En summ.]  
 CC N (Fats, Oils and Margarine)  
 CT ACIDS; FATTY ACIDS; FRIED FOODS; LIPIDS; PROCESSED FOODS

L4 ANSWER 19 OF 34 FSTA COPYRIGHT 2002 IFIS  
 AN 1993(12):N0025 FSTA  
 TI Physical properties and composition of low **trans canola** /**palm** blends partially modified by chemical interesterification.  
 AU Cho, F.; deMan, J. M.  
 CS Dep. de Sci. et Tech. des Aliments, Univ. Laval, Ste. Foy, Que. G1K 7P4, Canada  
 SO Journal of Food Lipids, (1993), 1 (1) 53-68, 36 ref.  
 ISSN: 1065-7258  
 DT Journal  
 LA English  
 AB Three partially interesterified low-**trans** fat blends aimed for soft margarines were formulated. They contained **palm** stearin (PS), hydrogenated rapeseed oil (HCO, iodine value = 66.5) and rapeseed oil (CO). The PS and HCO were co-randomized and CO was then added to complete the blends. Composition of the blends in terms of % of PS, HCO and CO were 10/30/60, 10/20/70 and 20/30/50. Their dropping point (DP) ranged between 30.5-35.2.degree.C. Solid fat contents were in the range of 11.0-21.1, 5.0-13.3 and 0.8-2.0% at 10, 20 and 35.degree.C, respectively. Crystallization temp. were between 11.4 and 16.0.degree.C. All 3 blends crystallized in the .beta.' polymorphic form. Their **trans** fatty acid contents were 8.7-12.1% and total **trans** and saturated fatty acid contents were 23.7-33.3%.  
 CC N (Fats, Oils and Margarine)  
 CT OILS; **PALM OILS**; RAPESEED OILS; VEGETABLE PRODUCTS

L4 ANSWER 20 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1993(08):N0004 FSTA  
 TI Effect of **palm oil**, margarine, butter, and **sunflower oil** on the serum lipids and lipoproteins of normocholesterolemic middle-aged men.  
 AU Wood, R.; Kubena, K.; Tseng, S.; Martin, G.; Crook, R.  
 CS Dep. of Biochem. & Biophysics, Nutr. & Med., Texas A&M Univ., College Station, TX 77843, USA  
 SO Journal of Nutritional Biochemistry, (1993), 4 (5) 286-297, 53 ref.  
 ISSN: 0955-2863  
 DT Journal  
 LA English  
 AB Twenty-nine healthy middle-aged men participated in a Latin square-designed study containing 6 dietary fats: butter; crude **palm oil**; hard margarine; refined **palm oil**; 80% refined **palm oil** + 20% **sunflower oil blend**; and **sunflower oil**. Each diet period was 6 wk followed by 6 wk of habitual diet. Test fats were consumed in ice cream, milk, cookies and as spreads and represented 50% of total fat energy (38%). Serum lipid responses to the high levels of test fats were small relative to habitual diet values. Large changes in quantity and type of fatty acids consumed daily were not reflected in fatty acid composition of total serum lipids. Butter did not elevate total serum or low density lipoprotein (LDL) cholesterol relative to habitual diet levels, but values were significantly higher than the **sunflower oil-diet** and **palm oil-diet** values. The **sunflower oil** diet produced the most dramatic changes: total serum cholesterol was reduced significantly relative to all diets except margarine, and lowest apolipoprotein B values were observed. However, high density lipoprotein (HDL) cholesterol and apolipoprotein A1 were also reduced on the **sunflower oil** diet. Diets containing crude or refined **palm oil** did not elevate total serum cholesterol relative to habitual diet, or LDL cholesterol or apolipoprotein levels relative to any diet. Refined **palm oil-diet** HDL cholesterol and apolipoprotein A1 levels were highest of all diets and significantly higher than **sunflower oil** diets. The hard margarine diet, containing 26% **trans** fatty acids, reduced apolipoprotein B values relative to habitual diet levels, but HDL cholesterol was reduced significantly relative to the refined **palm oil** diet. Comparison of diet fatty acid compositions suggests the decrease in the HDL cholesterol on the hard margarine diet may be due to **trans** fatty acids, produced during the partial hydrogenation of fats and oils.

CC N (Fats, Oils and Margarine)  
 CT ALCOHOLS; CHOLESTEROL; FATS; LIPIDS; OILS

L4 ANSWER 21 OF 34 FSTA COPYRIGHT 2002 IFIS  
 AN 1992(01):N0023 FSTA  
 TI Chemical and physical properties of the high melting glyceride fractions of commercial margarines.  
 AU D'Souza, V.; deMan, L.; deMan, J. M.  
 CS Correspondence (Reprint) address, J. M. deMan, Dep. of Food Sci., Univ. of Guelph, Guelph, Ont. N1G 2W1, Canada  
 SO Journal of the American Oil Chemists' Society, (1991), 68 (3) 153-162, 31 ref.  
 ISSN: 0003-021X  
 DT Journal  
 LA English  
 AB Fat obtained from 9 commercial margarines purchased from Canada and USA were crystallized from acetone at 15, 10, 5 and 0.degree.C. High melting triglyceride (HMG) fractions at 15.degree.C contained high levels of palmitic and stearic acids. The 18:1 levels increased as fractionation temp. decreased. Triglyceride analysis revealed that the HMG fractions

contained high levels of C54 and 52. Levels of **trans** isomers increased, whereas **trans** levels in the 18:1 decreased with fractionation temp. Margarines made from **canola oil** exhibited .beta. characteristics whereas **canola-palm**, soybean and **corn** margarines showed .beta.' crystals. Fractions crystallized from acetone showed numerous X-ray short spacings, characteristic of .beta.', .beta. and intermediate forms. On heating and cooling, the 15.degree.C fraction showed .beta.' or .alpha. and .beta.' characteristics regardless of the polymorphic form present in the original margarines. Differential scanning calorimetry m.p. of these fractions varied from 53 to 50.degree.C. The difference between the .beta. and .beta.' margarines could be related to the 16:0 and C54 content of the 15.degree.C fraction. In .beta. tending margarines the 16:0 content was <11%, in .beta.' tending margarines >17%. C54 in the 15.degree.C fraction of .beta. tending margarines was close to 70% and that of .beta.' tending margarines around 50%. The triglyceride C54 in the 15.degree.C fraction is .beta. tending and therefore should be kept as low as possible. In **canola** margarines this can be achieved by incorporation of **palm oil**, preferably in a slightly hydrogenated form.

CC N (Fats, Oils and Margarine)  
CT FATS; GLYCERIDES; LIPIDS; MARGARINES; MELTING; PHYSICAL PROPERTIES;  
MARGARINE

L4 ANSWER 22 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1988(08):N0047 FSTA

TI [Technology and quality.]

AU Fedeli, E.

CS Sta. Sperimentale per le Ind. degli Oli e dei Grassi, Milan, Italy

SO Rivista Italiana delle Sostanze Grasse, (1987), 64 (8) 299-304

ISSN: 0035-6808

DT Journal

LA Italian

SL English

AB The importance of the quality concept is applied to food fats and discussed with the aid of data on official guidelines, improvements in production technology, research and consumption patterns. The main techniques aimed at quality improvement include the use of antioxidants, refining by distillation, fractionation, chemical or enzymatic interesterification. Research and consumption patterns reveal an awareness of the importance of unsaturated fats with a min. of **trans** -acids. The appearance of **palm oil** in competition with **olive oil** is discussed.

CC N (Fats, Oils and Margarine)

CT FATS; OILS; QUALITY CONTROL

L4 ANSWER 23 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1988(07):N0009 FSTA

TI [Study of refined and unrefined vegetable oils and fats and their classification under food law regulations.]

Untersuchung und lebensmittelrechtliche Beurteilung von raffinierten und nicht raffinierten pflanzlichen Speiseoelen und Fetten.

AU Gertz, C.

CS Chemisches Untersuchungsamt, D-5800 Hagen 1, Federal Republic of Germany

SO Fett Wissenschaft Technologie, (1988), 90 (2) 45-50, 12 ref.

ISSN: 0931-5985

DT Journal

LA German

SL English

AB Formation of geometrical isomers of linoleic acid and changes in other constituents (sterols, tocopherols) occurring during refining of vegetable oils were studied to develop objective methods of differentiating refined from unrefined oils. Standards of identity in the German Food Codex define

cold-pressed native oil as that not subjected to alkali treatment, bleaching or deodorization. 4 vegetable oils (**palm**, **sunflower** seed, soybean and rapeseed oils), were degummed, neutralized, bleached and steam deodorized. Extensive tabulated data show contents in native oil and at each processing stage of 8 sterols, .alpha.-, .beta.-, .gamma.- and .delta.-tocopherols, dimeric and polymeric triglycerides, and **trans**-isomers of linoleic acid. Sterol and tocopherol composition was characteristic of each oil and was not significantly changed by refining, and can thus be used in identification of oils and fats. Only small amounts of polymeric triglycerides are formed during refining. Contents of **trans**-isomers of linoleic acid increased on deodorization; levels >0.2% (peak area) of total linoleic acid, determined by HPLC, indicate that a steam treatment not permitted for native oils has been used.

CC N (Fats, Oils and Margarine)  
CT ANALYTICAL TECHNIQUES; OILS; OILS VEGETABLE; REFINING; VEGETABLE OILS

L4 ANSWER 24 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1987(11):V0140 FSTA

TI Water-in-oil emulsions.

IN Leach, W.

PA Unilever plc; Unilever, London EC4P 4BQ, UK

SO UK Patent Application, (1987)

PI GB 2182942 A

PRAI GB 1985-28201 19851115

DT Patent

LA English

AB Margarines and shortenings for culinary use, baking or confectionery manufacture are prepared from fat-continuous food products, the consistency of which is represented by N values (measured by NMR methods) of 13-16 at 20.degree.C and .ltoreq.3 at 40.degree.C. They contain substantial amounts of polyunsaturated fatty acids, a max. of 30% saturated fatty acids, at least 2% **trans** fatty acids, and 5% palmitic acid and are derived from a mixture of vegetable oils (e.g. soybean, **sunflower** and **safflower**) with a selectively hardened fat (e.g. **soy** or **palm** fat).

CC V (Patents)

CT EMULSIONS; MARGARINES; PATENTS; SHORTENINGS; MARGARINE; PATENT;  
WATER-IN-OIL

L4 ANSWER 25 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1987(02):V0139 FSTA

TI Water-in-oil emulsions.

IN Lansbergen, G. J.

PA Unilever NV

SO European Patent, (1986)

PI EP 115655 B1

DT Patent

LA English

SL German; French

AB A water-in-oil emulsion comprises an aqueous phase emulsified in a fat phase, and the fat comprises: (i) 15-60% of a structure-imparting hard fat component consisting essentially of a mixture of triglycerides obtained by random interesterification of a substantially completely hydrogenated fat (a) which is rich in C8-C14 fatty acids or by random interesterification of a non-hydrogenated fat (a) and a fat (b) in which 40-100% of the fatty acids are saturated and mainly contain 16-22 C atoms; (ii) 40-85% of an oil which does not substantially contribute to the consistency of the emulsion within the temperature range 5-35.degree.C and which is substantially free of solid fat crystals at 10.degree.C; (iii) 0-25% of an oil hydrogenated to a m.p. of 30-45.degree.C. The ratio of linoleic acid to the sum of saturated and **trans**

fatty acids is .gtoreq.0.4 and the sum of components (i), (ii) and (iii) is equal to 100%. Fat (a) is preferably selected from coconut, **palm** kernel, babassu, murumuru, tucum, ouricurum, butter fat, fractions of these fats and mixtures, and is preferably hydrogenated to I value of <10. Fat (b) consists of hydrogenated soybean **oil**, rapeseed **oil**, **sunflower oil**, **safflower oil**, cottonseed **oil**, **corn oil**, **olive oil** or their mixtures in which 40-100% of the fatty acids are saturated. The described emulsions are particularly for print margarines or low-calorie spreads.

CC V (Patents)  
CT CALORIES; EMULSIONS; MARGARINES; PATENTS; SPREADS; CALORIES LOW SPREADS;  
MARGARINE; PATENT; **WATER-IN-OIL**; **WATER-IN-OIL # LOW**;  
**WATER-IN-OIL # PRINT**

L4 ANSWER 26 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1983(04):N0196 FSTA  
TI Edible fat product. II.  
IN Ward, J.  
PA Nabisco Brands Inc.  
SO United States Patent, (1982)  
PI US 4341813  
DT Patent  
LA English

AB Stick and pat margarines as well as blends and spreads, are formed from a **blend** of a vegetable **oil** such as, **sunflower oil**, with varying proportions of approx. 20-30 wt. % of hardstock, preferably formed by interestification of saturated babassu nut **oil** and saturated **palm oil**. The **blend** of vegetable **oil** and hardstock is high in polyunsaturates and has a low-**trans**-isomer fatty acid content.

CC N (Fats, Oils and Margarine)  
CT MARGARINES; OILS; OILS VEGETABLE; PATENTS; HARDSTOCK-VEGETABLE # BLENDS #  
SOFT; MARGARINE; PATENT

L4 ANSWER 27 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1983(04):N0195 FSTA  
TI Edible fat product. I.  
IN Ward, J.  
PA Nabisco Brands Inc.  
SO United States Patent, (1982)  
PI US 4341812  
DT Patent  
LA English

AB Soft margarines of both the tub and fluid type, as well as blends and spreads, are formed from a **blend** of liquid vegetable **oil**, such as **sunflower oil**, with varying proportions of approx. 5-20 wt. % of a hardstock, preferably formed by interesterification of saturated babassu nut **oil** and saturated **palm oil**. The **blend** of vegetable **oil** and hardstock is high in polyunsaturates and has a low-**trans**-isomer fatty acid content.

CC N (Fats, Oils and Margarine)  
CT MARGARINES; OILS; OILS VEGETABLE; PATENTS; HARDSTOCK-VEGETABLE # BLENDS #  
SOFT; MARGARINE; PATENT

L4 ANSWER 28 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1977(10):K0054 FSTA  
TI [Process for producing a cocoa butter substitute, and product thus obtained.]  
IN Karleskind, A.  
SO French Patent Application, (1976)

PI FR 2312198

DT Patent

LA French

AB A substitute for cocoa butter is obtained by hydrogenation of a mixture of e.g. **palm oil**, cottonseed **oil** and **sunflower seed oil** defined as follows: a mixture comprising 40-60% of a first vegetable **oil** of mp <20.degree.C and I number of 60-70, made up of 60-70% of C18 fatty acids, at least two-thirds of which comprise oleic acid, and 25-40% of palmitic acid; 40-60% of a second vegetable **oil** of mp <20.degree.C and I number 102-115, made up of at least 40% of C18 acids comprising linoleic acid and 17-28% of palmitic acid; and 0-20% of a correcting **oil** taken from various mixtures containing linoleic, oleic, palmitic and/or stearic acid. The liquid mixture is catalytically hydrogenated to obtain a max. of palmito-oleo-stearide glycerides, and is then fractionated to remove saturated glycerides and mono-unsaturated glycerides in which **trans**-oleic acid is present, this could possibly be followed by a further light hydrogenation.

CC K (Cocoa and Chocolate and Sugar Confectionery Products)

CT COCOA BUTTER; HYDROGENATION; OILS VEGETABLE; PATENTS; SIMULATED FOODS; COCOA BUTTER SUBSTITUTES; FRANCE; MIXTURES; OILS (VEGETABLE); PATENT; VEGETABLE OILS

L4 ANSWER 29 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1977(05):N0289 FSTA

TI Fatty acid composition of margarines, processed fats, and oils: a new compilation of data for tables of food composition.

AU Weihrauch, J. L.; Brignoli, C. A.; Reeves, J. B., III; Iverson, J. L.

CS Consumer & Food Economics Inst., USDA, Hyattsville, Maryland 20782, USA

SO Food Technology, (1977), 31 (2) 80-85, 91, 18 ref.

DT Journal

LA English

AB Data on the fatty acid (FA) composition of margarines and shortenings manufactured and marketed in the USA are tabulated and discussed. The data are derived from analyses by the FDA, from values supplied by manufacturers and distributors, and from values published in the literature since 1970. Data since 1960 are also considered and compared with more recent data. Tables give: FA composition of vegetable oils used in margarines (soybean, cottonseed, **corn**, **safflower**, peanut, coconut, **palm**, **sunflower**); FA composition of margarines (stick or brick, soft tub, liquid, industrial, light **blend**, diet imitation); content of total saturated, total monounsaturated, total polyunsaturated, total cis-methylene interrupted polyunsaturated FA and total **trans** bonds in margarines; FA composition of margarines compared to that of butter, lard and beef tallow; and FA composition of processed household and industrial oils and shortenings.

CC N (Fats, Oils and Margarine)

CT FATTY ACIDS; MARGARINES; SHORTENINGS; COMPOSITION; MARGARINE

L4 ANSWER 30 OF 34 FSTA COPYRIGHT 2002 IFIS

AN 1976(10):N0487 FSTA

TI [Composition and nutritive value of lard.]

Zusammensetzung und Wert des Schweinefettes. Untersuchungen und Betrachtungen.

AU Hanser, E.

CS Eidgenoessische Vet., Viktoriastrasse 85, CH-3000 Bern 25, Switzerland

SO Fleischwirtschaft, (1976), 56 (3) 323-328, 3 ref.

DT Conference

LA German

AB The nutritive value of lard is compared with the most important edible vegetable oils. Based on the % of polyunsaturated fatty acids and on the

presence of arachidonic acid (C20:4), it is comparable to **palm** and **olive oil**, and superior to **palm** kernel and coconut **oil**. In addition, the normally unrefined animal fats do not suffer **cis-trans** isomerization and loss of natural antioxidants.

CC N (Fats, Oils and Margarine)  
CT LARD; NUTRITIONAL VALUES

L4 ANSWER 31 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1976(07):N0304 FSTA  
TI [**Palm oil** processing. V. Comparison of processes and discussion.]

AU Martinenghi, G. B.  
CS Univ. of Milan, via De Togni 29, 20123 Milan, Italy  
SO Oleagineux, (1975), 30 (11) 475-477, 11 ref.  
DT Journal  
LA French

SL English; Spanish  
AB The following conclusions were drawn from a critical examination of the various possible treatments of **palm oil** based on the latest information: **palm oil** fractionation with hexane is the best method for separating liquid and "plastic" fraction (for margarine manufacture); both hydrogenation and esterification are isomerizing reaction, resulting in some formation of undesirable **trans** isomers; blending the liquid fraction with oils of low saturated and linolenic acid contents (e.g. low-erucic acid rapeseed or **sunflower oil**) is recommended for reducing the temp. of the permanent clear point to 6.degree.C. [See FSTA (1975) 7 1N15 for part IV.]

CC N (Fats, Oils and Margarine)  
CT **PALM OILS**; PROCESSING

L4 ANSWER 32 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1974(05):N0241 FSTA  
TI [Directed **trans**-esterification.]  
IN Maarten, A.; Cloostermann, A. B. M.; Rek, J. H. M.; Zock, H. F.  
PA Unilever NV  
SO Netherlands Patent Application, (1973)  
PI NL 7305104

DT Patent  
LA Dutch  
AB Crystallization during the directed **trans**-esterification of glyceride mixtures by addition of alkali metal (particularly Na) is improved by de-gassing (e.g. by applying a vacuum) of the glycerides after formation of the catalyst and before crystallization has taken place to any considerable degree. On completion of the reaction, the catalyst is de-activated with water, and the liquid glycerides are separated from the water containing the dispersed solid glycerides, which are subsequently separated out. The method is suitable for triglyceride oils, e.g. **palm oil**, **safflower oil** and, particularly, **sunflower seed oil**.

CC N (Fats, Oils and Margarine)  
CT CRYSTALLIZATION; ESTERIFICATION; GLYCERIDES; PATENTS; PATENT

L4 ANSWER 33 OF 34 FSTA COPYRIGHT 2002 IFIS  
AN 1972(02):N0056 FSTA  
TI [Margarine production process.]  
IN Wanders, W.  
PA Fritz Homann GmbH  
SO West German Patent Application, (1971)  
PI DE 1692521

DT Patent  
 LA German  
 AB Margarine is produced from a fat composition comprising a transesterification mixture of (i) <35 parts of coconut oil and >65 parts of palm oil or a similar oil, and (ii) an oil of the coconut oil type, or a mixture of such oils, or an oil mixture which mainly comprises coconut oil and which is completely trans-esterified prior to admixture to (i). (ii) preferably comprises coconut and palm kernel oil in a ratio of 1:1 and is added to (i) in amounts of 10-25% by wt. Other native or hydrated oils, e.g. soya, peanut, or sunflower oil, may also be added. After the usual processing, a margarine is obtained which does not exhibit granulation after long storage under varying conditions.

CC N (Fats, Oils and Margarine)  
 CT ESTERIFICATION; GRANULES; MARGARINES; STORAGE; COCONUT OIL; COMPOSITION; GRANULATION; GROUNDNUT OIL; MARGARINE; PALM OIL; PEANUT OIL; SOYBEAN OIL; SUNFLOWER OIL; TRANSESTERIFIED; COCONUT OIL ; GRANULATION ; MARGARINE ; PALM OIL ; SOYBEAN OIL ; STORAGE ; SUNFLOWER OIL

L4 ANSWER 34 OF 34 FSTA COPYRIGHT 2002 IFIS  
 AN 1971(04):N0179 FSTA  
 TI [Edible fat composition and process for its production.]  
 Verfahren zur Herstellung von Speisefettzusammensetzungen.  
 IN Caverly, B. L.; Rossell, J. B.  
 PA Unilever NV  
 SO West German Patent Application, (1969)  
 PI DE 1810061  
 DT Patent  
 LA German  
 AB An edible fat is produced by mixing 10-50 wt.% of a fat e.g. palm olive, cottonseed, or peanut oil, (.gtoreq.90% of the fatty acids of the triglycerides present are C.sub.1.sub.6 and C.sub.1.sub.8 acids, 10-45% being saturated fatty acids), with 50-90 wt.% of a fat e.g. rapeseed oil (30-75 wt.% of hte fatty acids of the triglycerides are C.sub.2.sub.0 and C.sub.2.sub.2 acids, and .ltoreq.20% are saturated acids). 85% of the 2-positions of both fats are occupied by a C.sub.1.sub.8 monoethylene acid radical, the components having a 40:75 trans-index. The process provides a method for intermixing hard fats without requiring additives adversely effecting flavour.

CC N (Fats, Oils and Margarine)  
 CT OILS; OILS VEGETABLE; STEROLDS; STEROLS; 4-METHYL; OILS (VEGETABLE); OLIVE OIL; RAPESEED OIL; SUNFLOWER OIL; VEGETABLE OILS; COTTONSEED OIL; EDIBLE; FAT; FATS (VEGETABLE); GROUNDNUT OIL; PALM OIL; PEANUT OIL

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 LAST RELOADED: Feb 15, 2002 (20020215/UP).

AN 1972(02):N0026 FSTA  
 TI Determination of low level isolated trans isomers in vegetable oils and derived methyl esters by differential infrared spectrophotometry.  
 AU Huang, A.; Firestone, D.  
 CS Div. of Food Chem. and Tech., FDA, Washington, DC 20204, USA  
 SO Journal of the Association of Official Analytical Chemists, (1971), 54 (1) 47-51, 6 ref.  
 DT Journal  
 LA English  
 AB A differential IR spectrophotometric method for determining low levels (1-6%) of isolated **trans** isomers in vegetable oils or derived methyl esters using a **trans** isomer **free** vegetable oil or derived methyl ester in the reference cell is described. A comparison with the AOCS procedure showed that the new method was more accurate. Detns. in oil mixtures were as accurate as those obtained with individual oils.  
 CC N (Fats, Oils and Margarine)  
 CT INFRARED RADIATION; ISOMERS; OILS; OILS VEGETABLE; SPECTROSCOPY; INFRARED; IR; OILS (VEGETABLE); SPECTROPHOTOMETRY; TRANS; VEGETABLE OILS; SPECTROPHOTOMETRY

L6 ANSWER 73 OF 73 FSTA COPYRIGHT 2002 IFIS  
 AN 1970(02):N0063 FSTA  
 TI [Method for preparing edible fat compositions.]  
 PA Unilever NV  
 SO Netherlands Patent Application, (1969)  
 PI NL 6816516  
 DT Patent  
 LA Dutch  
 AB The composition contains 10-50% by wt. of a non-re-esterified component A, in which .gtoreq.90% of the fatty acids of the triglycerides have 16-18 C atoms (10-45% of these fatty acids being saturated), and 50-90% of a non-re-esterified component B, in which 30-70% (by wt.) of the fatty acids of the triglycerides have 20-22 C atoms .ltoreq.20% of these fatty acids being saturated). In both A and B, 85% of the 2-position is occupied by a mono-valent saturated fatty acid radical with 18 C atoms, and the **trans**-index has a value between 40 and 75. The composition can be produced from a mixture of precursors of A and B by isomerization and/or selective hydrogenation. Component A may be prepared from palm oil, cottonseed oil, groundnut oil, or rapeseed oil which is **free** from erucic acid. Component B may be prepared from rapeseed oil or crambe oil.  
 CC N (Fats, Oils and Margarine)  
 CT FATS; FATTY ACIDS; GLYCERIDES; OILS; PLANTS; TRIGLYCERIDES; VEGETABLES SPECIFIC; COMPONENTS # EDIBLE; COMPONENTS # OIL # EDIBLE; COMPOSITIONS # EDIBLE; COTTONSEED; CRAMBE; EDIBLE; GROUNDNUT OIL ; PALM; PALMS; RAPESEED; SEA KALE

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SINCE FILE	TOTAL
ENTRY	SESSION
130.21	130.36

FULL ESTIMATED COST

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Index  
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FULL ESTIMATED COST

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=> s trans(s)free and (oil or spread or margarine)

3440 TRANS

30555 FREE

238 TRANS(S)FREE

35929 OIL

2406 SPREAD

2962 MARGARINE

L1 75 TRANS(S)FREE AND (OIL OR SPREAD OR MARGARINE)

=> s. (oil or spread or blend) and trans

35929 OIL

2406 SPREAD

2373 BLEND

3440 TRANS

L2 990 (OIL OR SPREAD OR BLEND) AND TRANS

=> s palm or lauric

3077 PALM

749 LAURIC

L3 3696 PALM OR LAURIC

=> s sunflower or canola or soy or pea or rice(w)bran or olive or safflower or cron  
or marine

4746 SUNFLOWER

746 CANOLA

12960 SOY

2429 PEA

12420 RICE

3984 BRAN

1140 RICE(W)BRAN

3786 OLIVE

953 SAFFLOWER

1 CRON

2923 MARINE

L4 27857 SUNFLOWER OR CANOLA OR SOY OR PEA OR RICE(W)BRAN OR OLIVE OR  
SAFFLOWER OR CRON OR MARINE

=> s 12 and 13 and 14  
L5 33 L2 AND L3 AND L4

=> 11 not 15  
L1 IS NOT A RECOGNIZED COMMAND  
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For a list of commands available to you in the current file, enter  
"HELP COMMANDS" at an arrow prompt (=>).

=> s 11 nor 15  
MISSING OPERATOR L1 NOR  
The search profile that was entered contains terms or  
nested terms that are not separated by a logical operator.

=> s 11 not 15  
L6 73 L1 NOT L5

=> d 16 all 1-73

L6 ANSWER 1 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 2002:N0228 FSTA

TI **Trans free** hard structural fat for **margarine**  
blend and spreads.

IN Sahasranamam, U. R.

PA Sahasranamam, Johor, MY, USA

SO United States Patent Application Publication, (2002)

PI US 2002001662 A1

PRAI MY 2000-2388 20000529

DT Patent

LA English

AB A **trans** fatty acid-free hard vegetable fat is  
described which is suitable for the manufacture of margarines, spreads and  
fat blends that have low contents of saturated fatty acids. The fat is  
prepared at high yield ratios from a non-hydrogenated palm oil  
fraction of high m.p. which is interesterified with a dry fractionated  
non-hydrogenated palm kernel fraction.

CC N (Fats, Oils and Margarine)

CT ESTERIFICATION; FATS VEGETABLE; FATTY ACIDS; PATENTS; INTERESTERIFICATION;  
TRANS FATTY ACIDS; VEGETABLE FATS

L6 ANSWER 2 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 2002:N0149 FSTA

TI **Trans free** hard structural fat for **margarine**  
blends and spreads.

IN Sahasranamam, U. M. R.

PA Premium Vegetable Oils Berhad; Premium Vegetable Oils Berhad, 50000 Kuala  
Lumpur, Malaysia

SO European Patent Application, (2001)

PI EP 1159877 A2

PRAI MY 2000-2388 20000529

DT Patent

LA English

AB A **trans**-fatty acid free hard structural fat suitable  
for manufacture of low saturated fatty acid, high mono- and  
polyunsaturated fatty acid margarines and spreads is described. It is  
made from selectively fractionated non-hydrogenated high m.p. palm  
oil fractions, interesterified with dry-fractionated  
non-hydrogenated palm kernel oil fractions. Yield ratios are  
high, and use of this interesterified product in margarines is  
economically attractive.

CC N (Fats, Oils and Margarine)

CT FATTY ACIDS; MARGARINES; PALM OILS; PATENTS; SPREADS; PALM KERNEL OILS

L6 ANSWER 3 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(12):N0904 FSTA  
TI **Trans-free** bakery shortenings from mango kernel and mahua fats by fractionation and blending.  
AU Yella Reddy, S.; Jeyarani, T.  
CS Lipid Sci. & Traditional Foods, Cent. Food Tech. Res. Inst., Mysore 570 013, India. E-mail sy\_reddy(a)yahoo.com  
SO Journal of the American Oil Chemists' Society, (2001), 78 (6) 635-640, 19 ref.  
ISSN: 0003-021X  
DT Journal  
LA English  
AB Bakery shortenings prepared by hydrogenation contain high levels of **trans** fatty acids, which are considered to be risk factors for cardiovascular disease. The possibility of using mango kernel and mahua (madhuca) kernel fats in the development of bakery shortenings **free** from **trans** fatty acids was studied. Mahua fat was dry fractionated to obtain a high-melting fraction (10% yield, Mh1). Mango fat was fractionated by 2-stage solvent fractionation to obtain a high-melting fraction (15% yield, Mk1) in the first stage, and stearin (40% yield, Mk2) in the second stage. The formulation containing 80% Mh1 and 20% of mango middle stearin (Mk2) showed melting characteristics and onset and enthalpy of crystallization properties similar to those of commercial hydrogenated shortenings designed for cakes and biscuits. A formulation suitable as a shortening for puff pastry was prepared by blending 50% mango 1st stearin (Mk1) and 50% mahua fat with 5-7% of fully hydrogenated vegetable oil. Formulations having melting characteristics similar to those of commercial cake and biscuit shortenings were also prepared by blending 40% mango fat and 60% mahua fat with 5-7% of fully hydrogenated peanut oil. However, these formulations showed delayed transition to stable forms compared with those of commercial samples. Fatty acid composition analysis revealed that commercial hydrogenated shortenings consisted of 18-29% **trans** oleic acid, whereas the test formulations did not contain any **trans** acids. I values of commercial samples were 57-58, whereas values for the test formulations were 47-53. Test samples were slightly harder than commercial samples, as measured by cone penetrometry. Results show that it is possible to prepare bakery shortenings that contain no **trans** fatty acids by using mango and mahua fats and their fractions.  
CC N (Fats, Oils and Margarine)  
CT FATS VEGETABLE; FATTY ACIDS; MANGOES; OILSEEDS; SHORTENINGS; MADHUCA SEEDS; MANGO KERNELS; TRANS FATTY ACIDS; VEGETABLE FATS

L6 ANSWER 4 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(09):N0741 FSTA  
TI Dietary **trans** .alpha.-linolenic acid does not inhibit .DELTA.5- and .DELTA.6-desaturation of linoleic acid in man.  
AU Scrimgeour, C. M.; Macvean, A.; Fernie, C. E.; Sebedio, J. L.; Riemersma, R. A.  
CS Correspondence (Reprint) address, R. A. Riemersma, Cardiovascular Res., Univ. of Edinburgh, Edinburgh EH8 9XF, UK. Tel. +44-131-650-3699. Fax +44-131-667-9092. E-mail Rudolph.Riemersma(a)ed.ac.uk  
SO European Journal of Lipid Science and Technology, (2001), 103 (6) 341-349, 37 ref.  
ISSN: 1438-7697  
DT Journal  
LA English  
AB As intake of rapeseed oil in Western countries is increasing, it is expected that the intake of **trans** .alpha.-linolenic acid formed during deodorization of .alpha.-linolenic acid-rich oils, such as

rapeseed oil, is also rising. Dietary **trans** monoenes have been linked with increased risk of coronary heart disease (CHD), however, little data are available regarding the effects of dietary **trans** polyenes on risk for this disease. In this study, effects of dietary **trans** .alpha.-linolenic acid (0.6% of energy) on the activities of .DELTA.5- and .DELTA.6-desaturases in vivo were studied, as inhibition of these desaturases has been linked to CHD risk. 7 healthy men (mean age 42 yr) followed experimental diets for at least 6 wk in which 30% of the habitual fat was replaced using a **trans-free** or a high **trans** .alpha.-linolenic acid fat. Desaturase activity was assessed by administering .sup.1.sup.3C-labelled linoleyl glycerol over a 10 day period and determining the fatty acid composition of plasma phospholipids and the incorporation of .sup.1.sup.3C into the n-6 fatty acids of these phospholipids. On the high **trans** diets, contents of **trans** .alpha.-linolenic acid in phospholipids increased from 0.04 to 0.17 g/100 g fatty acids, whereas the level of cis linolenic acid decreased from 0.42 to 0.29 g/100 g fatty acids. Enrichment of phosphatidyl .sup.1.sup.3C linolenic acid reached a peak at day 10 with no differences being detected between the low and high **trans** periods. Both dihomogamma.-linolenic acid (product of .DELTA.6-desaturation of .alpha.-linolenic acid and subsequent chain elongation) and arachidonic acid (product of .DELTA.5-desaturation of .sup.1.sup.3C; enrichment was slightly higher during the high **trans** period ( $P < 0.05$ ). Data suggest that a diet high in **trans** .alpha.-linolenic acid does not inhibit the activities of .DELTA.5- and .DELTA.6- desaturases in healthy middle-aged men consuming a diet rich in linoleic acid.

CC N (Fats, Oils and Margarine)  
CT FATTY ACIDS; HUMAN PHYSIOLOGY; LINOLENIC ACID; OXIDOREDUCTASES;  
DESATURASES; PHYSIOLOGICAL EFFECTS; TRANS FATTY ACIDS

L6 ANSWER 5 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(09):N0716 FSTA

TI Hydrogenated fat consumption affects cholesterol synthesis in moderately hypercholesterolemic women.

AU Matthan, N. R.; Ausman, L. M.; Lichtenstein, A. H.; Jones, P. J. H.  
CS Correspondence (Reprint) address, P. J. H. Jones, Sch. of Dietetics & Human Nutr., Fac. of Agric. & Environmental Sci., McGill Univ., Ste-Anne-de-Bellevue, Que. H9X 3V9, Canada

SO Journal of Lipid Research, (2000), 41 (5) 834-839, 37 ref.  
ISSN: 0022-2275

DT Journal

LA English

AB To determine mechanisms by which hydrogenated fat influences plasma lipid levels, 14 women (65-71 yr with low density lipoprotein-cholesterol (LDL-C) .gtoreq. 130 mg/dl) consumed, for a 5-wk period each, a baseline (BL) diet (39% kcal fat, 164 mg cholesterol/1000 kcal) and reduced fat diets (30% kcal) where two-thirds of the fat was either soybean oil (SO), low **trans** squeeze (SQM), medium **trans** tub (TM), or high **trans** stick (SM) margarines, or butter (BT). Plasma lipid levels were analysed at the end of each phase. Fractional synthesis rates (FSR) in pools/day (p/d) and absolute synthesis rates (ASR) in grams/day (g/d) of **free** cholesterol (FC) were measured using the deuterium incorporation methodology. Plasma total ( $P < 0.01$ ) and LDL-C ( $P < 0.05$ ) levels increased with increasing degree of hydrogenation or saturated fat intake. High density lipoprotein cholesterol levels ( $P < 0.05$ ) were lowest on the SM diet when compared to the BT diet. Low **trans** SQM (0.081 .+- . 0.019 p/d) and medium **trans** TM (0.086 .+- . 0.029 p/d) diets elicited responses similar to the SO (0.078 .+- . 0.024 p/d) diet, whereas high **trans** SM (0.053 .+- . 0.029 p/d) diet mimicked the BT (0.062 .+- . 0.017 p/d) and

high fat BL (0.053  $\pm$  0.023 p/d) diet in its suppression ( $P < 0.05$ ) of FSR-FC. ASR-FC, which is an approximation of the daily production of newly synthesized cholesterol, showed a trend similar to the FSR-FC data. These results indicate that reduced synthesis is not responsible for the higher plasma total cholesterol levels seen with consumption of the SM, BT, and BL diets, and suggest that another mechanism, possibly impairment of the catabolic pathway of cholesterol, is involved.

CC N (Fats, Oils and Margarine)  
CT CHOLESTEROL; DIET; FATS; HUMAN PHYSIOLOGY; POPULATION GROUPS; HYDROGENATED FATS; LIPAEMIC ACTIVITY; WOMEN

L6 ANSWER 6 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(08):N0681 FSTA

TI New palm-based products.

AU Basiron, Y.

CS Malaysian Palm Oil Board (MPOB) No. 6, Persiaran Inst., Bandar Baru Bangi, 43000 Kajang, Selangor, Malaysia

SO Journal of Oleo Science, (2001), 50 (5) 295-303, 29 ref.  
ISSN: 1345-8957

DT Journal

LA English

AB Recent developments in the production of novel products based on palm oils are discussed with particular reference to the Malaysian palm oil industry. Aspects considered include: products from oil palm cultivation; research and development - role of the Malaysian Palm Oil Board; food products from palm oil and palm kernel oil (red palm oil - new cooking/frying oils, shortenings, **trans-free** vanaspati, margarines and spreads, non-dairy/imitation dairy products, palm-based processed cheese and yoghurt, and spray-dried products (santan powder and ice cream mix powder)); nutraceutical products from palm oil (tocopherols, tocotrienols and carotenes); non-food products; utilization of oil palm biomass; and new planting materials. [This paper was originally presented at the Japan Oil Chemists' Society and American Oil Chemists' Society World Congress 2000 (JAWC 2000), held in Kyoto, Japan, Oct. 2000.]

CC N (Fats, Oils and Margarine)

CT NOVEL FOODS; PALM OILS; DEVELOPMENTS; FOODS; NUTRACEUTICAL FOODS

L6 ANSWER 7 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(08):N0661 FSTA

TI Synthesis of a low trans-content edible oil, non-edible oil, or fatty acid in a solid polymer electrolyte reactor.

IN Pintauro, P. N.

PA Administrators of the Tulane Educational Fund; Administrators of the Tulane Educational Fund, New Orleans, LA, USA

SO United States Patent, (2001)

PI US 6218556

B1

PRAI US @@@-748210

19961112

DT Patent

LA English

AB An electrochemical process for hydrogenating unsaturated fatty acids, mixtures of  $\geq 2$  fatty acids, or the unsaturated fatty acid constituents of edible or non-edible oil triglycerides using a solid polymer electrolyte reactor is described. Membrane electrode assemblies consist of a cation exchange membrane onto which porous anode and cathode electrodes are attached. As the electrodes are permeable, reactants and products enter and leave the membrane/cathode and membrane/anode reaction zones via the back sides of the electrodes. Hydrogen is generated in situ by the electro-reduction of protons that are formed at the anode and that migrate through the ion exchange membrane for reaction with the fatty acids. Only protons carry the current between the

anode and the cathode, and the need for a supporting electrolyte to conduct electricity is eliminated. The process operates at low to moderate temp. and atmospheric or moderate pressure. A novel partially hydrogenated oil product selected from either a partially hydrogenated fatty acid, a partially hydrogenated triglyceride and mixtures thereof is also described. This product has a **trans** isomer content lower than that of a similarly hydrogenated oil product formed at high temp. in a chemical process, a peroxide value <1.5% and a **free** fatty acid content <0.02%, and is of good purity.

CC N (Fats, Oils and Margarine)  
CT ELECTRICITY; FATTY ACIDS; HYDROGENATION; PATENTS; TRIGLYCERIDES

L6 ANSWER 8 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 2001(08):N0660 FSTA

TI Nitrogen bubble refining of sunflower oil in shallow pools.

AU Tsiadi, A. V.; Stavrides, E.; Handa-Corrigan, A.

CS 24-26, 28th October St., 41-223 Larisa, Greece. E-mail

atsiadi(a)netplan.gr

SO Journal of the American Oil Chemists' Society, (2001), 78 (4) 381-385, 28 ref.

ISSN: 0003-021X

DT Journal

LA English

AB High-temp. steam deodorization of sunflower oil results in formation of unwanted by-products, such as **trans** isomers and polymers, and partial destruction of vitamins. There is a need to develop a process that replaces steam with an inert gas such as N.sub.2. Use of bubble sparging at low temp. has recently been reported as a technique that can strip volatiles from edible oils. In this study, a hypothesis was proposed that N.sub.2 bubbles sparged at temp. of 25-150.degree.C are able to remove odoriferous, surface-active, or volatile contaminants from shallow pools of sunflower oil. Analysis of the composition of sunflower oil that had been sparged at 3 mbar pressure showed that contents of aroma compounds and peroxides in the oil were considerably reduced to values that are commercially acceptable. Aroma improvement occurred at temp. between 100 and 150.degree.C, while the peroxide content reduction was achieved at a temp. of 150.degree.C. There were no significant improvements in **free** fatty acid concn. or colour.

CC N (Fats, Oils and Margarine)

CT AROMA; AROMA COMPOUNDS; DEODORIZATION; NITROGEN; PEROXIDES; REFINING; SUNFLOWER OILS; TEMPERATURE; VOLATILE COMPOUNDS; N2; TEMP.

L6 ANSWER 9 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 2001(08):N0607 FSTA

TI Trans fatty acid contents of margarines and baked confectioneries produced in the United States.

AU Okamoto, T.; Matsuzaki, H.; Maruyama, T.; Niiya, I.; Sugano, M.

CS Japan Inst. of Oils & Fats, 3-27-8, Nihonbashi-Hamacho, Chuo-ku, Tokyo 103-0007, Japan. E-mail okamoto(a)syken.or.jp

SO Journal of Oleo Science, (2001), 50 (2) 137-142, 15 ref.  
ISSN: 1345-8957

DT Journal

LA Japanese

SL English

AB **Trans** fatty acid content was determined in 16 margarines and 25 baked confectionery products manufactured in the USA and purchased in 1998. Analysis of **trans** fatty acids was carried out by capillary GLC in conjunction with silver nitrate impregnated TLC. Total **trans** fatty acid content of cup type margarines averaged 12.1% (0.8-19.5%), being slightly lower than previously reported. 2 samples contained <1% of total **trans** fatty acids produced by

unhydrogenated oil or diacylglycerol (approx. 4%) instead of hydrogenated oil. 1 margarine sample labelled 'trans fatty acid free' contained trans fatty acids at 11.6% (0.3 g/serving). Average total trans fatty acid content of carton type margarines was 23.4% (18.0-27.5%), essentially the same as previously reported. Bottled margarines contained 2.4% total trans fatty acids on average. Average total trans fatty acid content of cookies, crackers and other baked confectionery was 20.8 (8.6-34.1), 31.7 (12.2-40.5) and 26.1 (5.2-40.0%), respectively; the corresponding values for products purchased in 1994 were, for cookies (n = 6), 23.1% and crackers (n = 13), 30.4%.

CC N (Fats, Oils and Margarine)  
CT BISCUITS; FATTY ACIDS; MARGARINES; COOKIES; CRACKERS; TRANS FATTY ACIDS

L6 ANSWER 10 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(07):A1213 FSTA

TI Magnetic resonance in food science: a view to the future.  
AU Webb, G. A. (Editor); Belton, P. S. (Editor); Gil, A. M. (Editor);  
Delgadillo, I. (Editor)

CS Thomas Graham House, Science Park, Milton Rd., Cambridge CB4 0WF, UK;  
Royal Society of Chemistry. Tel. +44 (0)1223 432360. Fax +44 (0)1223  
423429. E-mail sales(a)rsc.org. Price .pnd.69.50 Univ. of Surrey,  
Guildford, UK

SO (2001), ix + 271pp. ISBN 0-85404-870-7, many ref.

DT Conference

LA English

.AB Proceedings of the 2nd International Conference on Applications of  
Magnetic Resonance in Food Science held in Aveiro, Portugal, on 18-20  
Sept. 2000 are presented. The conference was organized into 4 symposia,  
each of which forms a section in this book. The first section, A view  
towards the next century, includes 8 presentations on recent advances in  
solid-state NMR, hyphenated methods in NMR and use of magnetic resonance  
imaging (MRI) in analysis of: meat structure; pH and redox in foods;  
carrageenan gels and sols; wheat dough structure; sensory properties of  
soft cheese; and mannitol production by GM Lactococcus lactis. The Food  
safety and health section features 7 articles on MRI of gastric function  
and use of NMR techniques for studying free radicals,  
trans-resveratrol, oleuropein and antioxidative activities of  
natural antioxidants, phenols and spices. In Structure and dynamics, use  
of MRI for studying chemical structure and molecular mobility is discussed  
in 7 articles using examples of starch granules, lecithin-water systems,  
sugar solutions, and .beta.-casein-emulsion interfaces; slicing as a novel  
approach for deconvolution of NMR relaxation decays is also discussed.  
The final section, Analysis, monitoring and authentication, comprises 7  
articles that consider use of MRI for authentication of virgin olive  
oil, wild and farmed salmon and meat, and analysis of loin from  
Iberian swine, fat distribution of fish, and mangoes.

CC A (Food Sciences)  
CT CONFERENCE PROCEEDINGS; NUCLEAR MAGNETIC RESONANCE; FOODS; MAGNETIC  
RESONANCE IMAGING

L6 ANSWER 11 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(05):N0413 FSTA

TI Technical aspects of trans reduction in margarines.

AU Duijn, G. van

CS TUSCC/Unilever Research, Olivier van Noortlaan 120, 3133 AT Vlaardingen,  
Netherlands

SO OCL, (2000), 7 (1) 95-98, 3 ref.  
ISSN: 1258-8210

DT Journal

LA French

SL English

AB Reduction of **trans** fatty acid levels in margarines is discussed with reference to: properties of oils and fats suitable for **margarine** production; development of **trans** fatty acids during partial hydrogenation of oils and fats; and use of fat phase components obtained from interesterification and/or fractionation of non-hydrogenated and/or fully hydrogenated feedstocks to produce fat crystal structures suitable for use in production of **trans** fatty acid-free margarines.

CC N (Fats, Oils and Margarine)  
CT FATTY ACIDS; MARGARINES; TRANS FATTY ACIDS

L6 ANSWER 12 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(05):N0368 FSTA

TI Evaluation of soybean oil quality during conventional frying by FTIR and some chemical indexes.

AU Dayawatee Goburdhun; Jhaumeer-Laulloo, S. B.; Ravish Musruck  
CS Fac. of Agric., Univ. of Mauritius, Reduit, Mauritius

SO International Journal of Food Sciences and Nutrition, (2001), 52 (1)  
31-42, 13 ref.  
ISSN: 0963-7486

DT Journal

LA English

AB Deterioration of soybean oil was studied during the frying of potato chips. The oil was subjected to continuous frying at 180.degree.C for a total of 600 min. Quality changes in soybean oil were evaluated at 90 min intervals by FTIR spectroscopy and measurement of routine chemical parameters, namely peroxide value, iodine value and **free** fatty acid content. Increases in hydroperoxide and **free** fatty acid concn. were observed during the frying process by both FTIR and chemical analysis. A significant decrease in tryglyceride ester linkages was observed by FTIR. The linear decrease in iodine value ( $P < 0.01$ ) indicated a general loss of unsaturation. Furthermore, FTIR studies showed a loss of cis double bonds and an increase in **trans** unsaturation. Formation of unsaturated aldehydes was also observed during the frying process by FTIR spectroscopy. It is concluded that soybean oil deteriorates after continued frying and that this deterioration can be monitored by both FTIR spectroscopy and chemical methods.

CC N (Fats, Oils and Margarine)  
CT FRYING; SOYBEAN OILS; SPECTROSCOPY; FOURIER TRANSFORM IR SPECTROSCOPY; QUALITY

L6 ANSWER 13 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(03):N0230 FSTA

TI Electrochemical hydrogenation of edible oils in a solid polymer electrolyte reactor. Sensory and compositional characteristics of low trans soybean oils.

AU Warner, K.; Neff, W. E.; List, G. R.; Pintauro, P.  
CS NCAUR, 1815 North University St., Peoria, IL 61604, USA. E-mail warnerk(a)mail.usda.ncaur.gov

SO Journal of the American Oil Chemists' Society, (2000), 77 (10) 1113-1117,  
20 ref.  
ISSN: 0003-021X

DT Journal

LA English

AB Soybean oils were hydrogenated either electrochemically with Pd at 50 or 60.degree.C to iodine values (IV) of 104 and 90 or commercially with Ni to iodine values of 94 and 68. To determine composition and sensory characteristics, oils were evaluated for triacylglycerol (TAG) structure, stereospecificity, fatty acids, solid fat index, and odour (aroma) attributes in room odour tests. **Trans** fatty acid contents were 17 and 43.5% for the commercially hydrogenated oils and 9.8% for both

electrochemically hydrogenated products. Higher levels of stearic and linoleic acids were found in the electrochemically hydrogenated oils and higher oleic acid levels in the chemically hydrogenated products. TAG analysis confirmed these findings. Monoenes were the predominant species in commercial oils, whereas dienes and saturates were predominant components of the electrochemically processed samples. **Free** fatty acid values and peroxide values were low in electrochemically hydrogenated oils, indicating no problems from hydrolysis or oxidation during hydrogenation. The solid fat index profile of a 15:85 blend of electrochemically hydrogenated soybean oil (IV = 90) with a liquid soybean oil was equivalent to that of a commercial stick **margarine**. In room odour evaluations of oils heated at frying temp. (190.degree.C), chemically hydrogenated soybean oils showed strong intensities of an undesirable characteristic hydrogenation aroma (waxy, sweet, flowery, fruity, and/or crayon-like odours). However, electrochemically hydrogenated samples showed only weak intensities of this odour, indicating that the hydrogenation aroma/flavour would be much less detectable in foods fried in the electrochemically hydrogenated soybean oils than in chemically hydrogenated soybean oils. Electrochemical hydrogenation produced deodorized oils with lower levels of **trans** fatty acids, compositions suitable for margarines, and lower intensity levels of off-odours, including hydrogenation aroma, when heated to 190.degree.C, than did commercially hydrogenated oil.

CC N (Fats, Oils and Margarine)  
CT FATTY ACIDS; HYDROGENATION; SENSORY PROPERTIES; SOYBEAN OILS; COMPOSITION;  
TRANS FATTY ACIDS

L6 ANSWER 14 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(02):P0263 FSTA  
TI New study reveals **trans** fatty acid-free butter is healthier than **margarine**.  
AU Anon.  
SO Cheese Reporter, (1999), 123 (50) 1, 10  
ISSN: 0009-2142  
DT Journal  
LA English  
CC P (Milk and Dairy Products)  
CT BUTTER; FATTY ACIDS; HEALTH; MARGARINES; TITLE; TRANS FATTY ACIDS

L6 ANSWER 15 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2001(01):P0088 FSTA  
TI Effects of buffers on milk fatty acids and mammary arteriovenous differences in dairy cows fed Ca salts of fatty acids.  
AU Thivierge, M. C.; Choouinard, P. Y.; Levesque, J.; Girard, V.; Seoane, J. R.; Brisson, G. J.  
CS Dep. des Sci. Animales, Pavillon Paul-Comtois, Univ. Laval, Sainte-Foy, Que. G1K 7P4, Canada  
SO Journal of Dairy Science, (1998), 81 (7) 2001-2010, 38 ref.  
ISSN: 0022-0302  
DT Journal  
LA English  
AB Ten Holstein cows in early lactation were used in a replicated 5 x 5 Latin square design to study effects of MgO and 3 buffers added to diets containing Ca salts of canola oil (rapeseed oil) fatty acids. Treatments were: control (basal diet; no buffer); 1.1% NaHCO.sub.3 plus 1.1% KHCO.sub.3; 1.9% NaHCO.sub.3; 0.5% MgO; and 2.0% sodium sesquicarbonate (percentage of DM). The control diet contained 53% grass silage, 43% concentrate, and 4% Ca salts. Body wt., intake, milk yield, and percentages of milk fat, protein, and lactose were unaffected by treatments. Buffers and MgO tended to increase triacylglycerol extraction by the mammary gland and changed the proportions of some fatty acids in milk. Extraction by the mammary gland was high for acetate

(approx. 58.2%), triacylglycerol (47.3%), propionate (34.6%), and glucose (24.3%). Extraction of **free** fatty acids, phospholipids, or cholesterol was negligible. Sodium sesquicarbonate, NaHCO.sub.3, and the blend of bicarbonate buffers increased C18:2 in milk fat when compared with the control treatment. The concn. of C18:2 in milk fat decreased when MgO was fed, but the ratio of cis-C18:1 to **trans**-C18:1 increased compared with effects of dietary NaHCO.sub.3. Medium-chain fatty acids in milk fat tended to be higher with sodium sesquicarbonate than with NaHCO.sub.3. Buffers and MgO modified the profiles of fatty acids in milk.

CC P (Milk and Dairy Products)  
CT FEEDS; MILK; COMPOSITION

L6 ANSWER 16 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2000(11):H2577 FSTA

TI Antioxidant activity of malt rootlet extracts.  
AU Bonnely, S.; Peyrat-Maillard, M. N.; Rondini, L.; Masy, D.; Berset, C.  
CS Correspondence (Reprint) address, C. Berset, Dep. Sci. de l'Aliment, ENSIA, 1 Ave. des Olympiades, 91744 Massy Cedex, France. Fax 33-1-69-935020. E-mail berset(a)ensia.inra.fr  
SO Journal of Agricultural and Food Chemistry, (2000), 48 (7) 2785-2792, 31 ref.  
ISSN: 0021-8561

DT Journal

LA English

AB In an attempt to improve their value, the antioxidative activity of barley malt rootlets, a malt industry by-product, was investigated. In particular, DM yield, antioxidant level, and ease and cost of extraction were determined for 3 rootlet preparations: rootlet **oil**, and tissue extracts containing **free** phenols or bound phenols. The rootlet **oil** contained low antioxidant levels (20.6 and 4.2 .mu.g/g root DM for .alpha.- and .gamma.-tocopherol, respectively), and it displayed only weak antioxidative activity in a spectrophotometric assay following conjugated diene production in stripped corn **oil**. The extract containing bound phenols by comparison showed good antioxidative activity, due to the presence of **trans**-ferulic and **trans**-p-coumaric acids, but was only produced at a low yield (2% DM). The tissue extract which included **free** phenols could be produced with a yield of 12% DM and it also displayed a good antioxidative activity; this extract contained 52% protein, 33% sugars and 5.5% reducing compounds. In a test of synergism between the different rootlet preparations, a positive effect was observed after mixing .alpha.-tocopherol and the **free** phenols-containing extract.

CC H (Alcoholic and Non-Alcoholic Beverages)  
CT BY-PRODUCTS; MALT; OXIDATION; PHENOLS; ANTIOXIDATIVE ACTIVITY

L6 ANSWER 17 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2000(09):B1410 FSTA

TI Purification of a jojoba embryo fatty acyl-coenzyme A reductase and expression of its cDNA in high erucic acid rapeseed.  
AU Metz, J. G.; Pollard, M. R.; Anderson, L.; Hayes, T. R.; Lassner, M. W.  
CS Calgene Campus, Monsanto, 1920 Fifth St., Davis, CA 95616, USA. Fax 530-792-2453. E-mail jim.metz(a)monsanto.com  
SO Plant Physiology, (2000), 122 (3) 635-644, 40 ref.  
ISSN: 0032-0889

DT Journal

LA English

AB The jojoba plant (*Simmondsia chinensis*) produces esters of long-chain alcohols and fatty acids (waxes) as a seed lipid energy reserve. This is in contrast to the triglycerides found in seeds of other plants. An alcohol-forming fatty acyl-coenzyme A reductase (FAR) was purified from developing jojoba embryos and the cDNA encoding the enzyme was cloned.

Expression of this cDNA in *Escherichia coli* conferred FAR activity upon cells and resulted in the accumulation of fatty alcohols. The FAR sequence showed significant homology to an *Arabidopsis* protein of unknown function that is essential for pollen development. When the jojoba FAR cDNA was expressed in embryos of *Brassica napus* (rapeseed), long-chain alcohols were detected in **trans**-methylated seed oils. Resynthesis of the gene to reduce its A plus T content resulted in increased levels of alcohol production. In addition to **free** alcohols, novel wax esters were also detected in the transgenic seed oils. In vitro assays revealed that *B. napus* embryos have an endogenous fatty acyl-coenzyme A: fatty alcohol acyl-transferase activity that could account for this wax synthesis. Thus, introduction of a single cDNA into *B. napus* results in a redirection of a portion of seed oil synthesis from triglycerides to waxes.

CC B (Biotechnology)  
CT GENE EXPRESSION; OXIDOREDUCTASES; PLANTS; RAPESEEDS; WAXES; JOJOBA; REDUCTASES

L6 ANSWER 18 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2000(09):A1323 FSTA  
TI Dietary psyllium reverses hypercholesterolemic effect of trans fatty acids in rats.

AU ChengShun Fang  
CS Dep. of Nutr. & Dietetics, Univ. of Delaware, Newark, DE 19716, USA.  
E-mail rfang(a)udel.edu  
SO Nutrition Research, (2000), 20 (5) 695-705, 32 ref.  
ISSN: 0271-5317

DT Journal

LA English

AB Effects of dietary psyllium fibre and **trans** fatty acids (TFA) on serum cholesterol were studied in rats in order to test the hypothesis that psyllium would reverse the hyperlipaemia associated with TFA. Animals were fed a diet containing either corn/olive oil mix (**free** of TFA) or **margarine** (16% TFA), with or without added psyllium for 4 wk. Total serum cholesterol levels in rats fed the **margarine** diet were significantly higher than those fed the oil mix, while the reverse trend was apparent for HDL-cholesterol. However, addition of psyllium to the diet significantly decreased total cholesterol and significantly increased HDL cholesterol for rats receiving the **margarine** diet. Analysis of total faecal lipids showed that dietary psyllium also significantly reduced fat absorption, particularly in animals fed the **margarine** diet. These results confirm that a diet rich in TFA can have hypercholesterolaemic effects and suggest that psyllium may have the ability to limit these effects in those consuming a TFA rich diet.

CC A (Food Sciences)  
CT DIET; DISEASES; FATTY ACIDS; SEEDS; ANIMAL MODELS; HYPERLIPAEMIA; PSYLLIUM; TRANS FATTY ACIDS

L6 ANSWER 19 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2000(06):N0274 FSTA  
TI Effect of physical refining on selected minor components in vegetable oils.

AU Greyt, W. F. de; Kellens, M. J.; Huyghebaert, A. D.  
CS De Smet Engineering NV, Edegem, Belgium  
SO European Journal of Lipid Science and Technology, (1999), 101 (11) 428-432, 18 ref.  
ISSN: 1438-7697

DT Journal

LA English

SL German

AB Studies were conducted to assess effects of physical deodorization

conditions (time, temp., pressure and use of stripping steam) on contents of **trans**-fatty acids, tocopherols and polymeric or oxidized triglycerides in vegetable oils. A sample of neutralized soybean oil was used with added commercial oleic acid to give an initial **free** fatty acid concn. of approx. 1%. Mathematical models were developed linking process parameters to concn. of the constituents studied. **Trans**-fatty acid formation increased with increasing temp. and duration of the deodorization process, but was unaffected by pressure or steam. **Trans**-isomerization of .alpha.-linolenic acid was much greater than that of linoleic acid. Tocopherol removal was mainly a distillation phenomenon, and was influenced by process temp. and sparging steam. Deodorization equipment design also influenced tocopherol loss. Concn. of oxidized or polymeric triglycerides were not significantly affected by any of the deodorization process parameters studied. Optimization of deodorization conditions to minimize **trans**-fatty acid formation and maximize tocopherol retention are discussed

CC N (Fats, Oils and Margarine)  
CT DEODORIZATION; FATTY ACIDS; SOYBEAN OILS; TOCOPHEROLS; TRIGLYCERIDES;  
TRANS FATTY ACIDS

L6 ANSWER 20 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 2000(04):N0190 FSTA  
TI **Trans-free margarine** from highly saturated

soybean oil.  
AU Li Lee Kok; Fehr, W. R.; Hammond, E. G.; White, P. J.  
CS Correspondence (Reprint) address, P. J. White, 2312 Food Sci. Building,  
Iowa State Univ. Ames, IA 50011, USA. E-mail pjwhite(a)iastate.edu  
SO Journal of the American Oil Chemists' Society, (1999), 76 (10) 1175-1181,  
27 ref.  
ISSN: 0003-021X

DT Journal  
LA English

AB Highly saturated (HS) soybean oil (SBO), containing 23.3% palmitic acid (C16:0) and 20.0% stearic acid (C18:0), was interesterified at 70.degree.C in preparation for the processing of a **trans-free margarine**. HPLC analysis of the triacylglycerides and analysis of the sn-2 fatty acid composition showed no further change after 10 min of interesterification. Interesterified HS SBO had a slip m.p. of 34.5.degree.C, compared with 9.5.degree.C in non-interesterified HS SBO; increased melting and crystallization temp. were found using DSC. NMR analysis of solid fat content revealed the presence of only a small amount of solids above 33.degree.C. A 50:50 blend of interesterified HS SBO and SBO with a typical fatty acid composition was used to make the **margarine**. Texture analysis indicated that the blended **margarine** showed approx. 2.3x greater max. peak force, approx. 2.6x greater hardness and approx. 1.5x greater adhesiveness than commercial soft-tub **margarine**. Small but statistically significant differences (.alpha. = 0.05) were observed between the commercial and blended margarines in terms of the sensory properties of spreadability, graininess and waxiness at 4.5.degree.C and, except for graininess, at 11.5.degree.C. These very small differences suggest a potential use for HS SBO in **margarine** products.

CC N (Fats, Oils and Margarine)  
CT ESTERIFICATION; FATTY ACIDS; MARGARINES; PHYSICAL PROPERTIES; SENSORY PROPERTIES; SOYBEAN OILS; TRIGLYCERIDES; INTERESTERIFICATION; PHYSICOCHEMICAL PROPERTIES; TRIACYLGLYCEROLS

L6 ANSWER 21 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1999(12):N0748 FSTA  
TI Volatile constituents and oxidative stability of virgin olive oils:  
influence of the kneading of olive paste.

AU Lercker, G.; Frega, N.; Bocci, F.; Mozzon, M.  
CS Istituto di Ind. Agrarie, Univ. degli Studi di Bologna, 401216 Bologna,  
Italy. E-mail lercker(a)biblio.cib.unibo.it  
SO Grasas y Aceites, (1999), 50 (1) 26-29, 12 ref.  
ISSN: 0017-3495

DT Journal

LA English

SL Spanish

AB Effects of olive paste kneading conditions on oxidative stability and  
aroma compounds in virgin olive oils were examined, using Frantoio and  
Moraiolo cv. olives ground together in a metal crusher and then subjected  
to kneading at 21.degree.C for 20-70 min. Oils obtained by centrifugation  
were membrane filtered and analysed for **free** fatty acids and  
peroxide values; volatile compounds (aldehydes) were collected in a  
charcoal cartridge and were analysed by capillary GC. Minor compounds  
were also analysed by reversed-phase HPLC and capillary GC. The volatile  
fraction contained approx. 20% **trans** 2-hexenal (TTH) at the end  
of crushing, increasing to approx. 50% after 70 min of kneading. Hexanal  
content also doubled during this period, but was significantly lower than  
that of TTH. TTH formation may be useful for sensory characterization of  
virgin olive oils (green odour note); intense lipoperoxidase activity  
enhanced primary levels of autooxidation products (hydroperoxides).  
Enzymic activity generated important aroma compounds but also affected  
shelf life of the resulting **oil**. After kneading, hexanal concn.  
progressively increased and that of TTH decreased, altering sensory  
properties of the **oil**. It is concluded that olive paste  
kneading generates desirable aroma compounds at the expense of shelf life;  
kneading temp. and other conditions can also affect results.

CC N (Fats, Oils and Margarine)

CT ALDEHYDES; AROMA COMPOUNDS; KNEADING; OLIVE OILS; OLIVES; OXIDATION;  
PASTES; SHELF LIFE; OXIDATIVE STABILITY

L6 ANSWER 22 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1999(12):N0743 FSTA

TI Industrial thin-film deodorization of seed oils with SoftColumn.RTM.  
technology.

AU Ahrens, D.

CS Alfa Laval Separation AB, Oil & Protein Technology, SE-147 80 Tumba,  
Sweden

SO Fett/Lipid, (1999), 101 (7) 230-234, 7 ref.  
ISSN: 0931-5985

DT Journal

LA English

SL German

AB The Alfa Laval SoftColumn.RTM. process for thin film deodorization of  
vegetable oils is described. It is based on a structured packing section  
and a flexible holding section for prolonging residence time.  
Regenerative heating and cooling of the **oil** are used; final  
heating is by means of external sparged vacuum heat exchangers. The  
process has good energy efficiency, with consequent economic advantages.  
**Oil** quality is good; stripping of **free** fatty acids is  
very efficient, which means that relatively short holding times at high  
temp. are required. Steam consumption is only one-third that of  
conventional deodorizers. The deodorized **oil** has low colour  
value and acidity, good taste and stability, and low concn. of  
**trans**-fatty acids. The equipment may be optimized for either  
removal or retention of tocopherol. The process is highly flexible;  
parameters such as thermal bleaching or **trans**-fatty acid  
formation may be adjusted without changing production capacity.  
Performance of the process is discussed with reference to data for soybean  
**oil** and low erucic acid rapeseed **oil**.

CC N (Fats, Oils and Margarine)

CT DEODORIZATION; OILS VEGETABLE; VEGETABLE OILS  
TN Alfa Laval; SoftColumn

L6 ANSWER 23 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1999(11):N0667 FSTA

— TI **Trans-free** vanaspati containing ternary blends of palm  
oil-palm stearin-palm olein and palm oil-palm  
stearin-palm kernel olein.

AU Nor Aini, I.; Che Maimon, C. H.; Hanirah, H.; Zawiah, S.; Che Man, Y. B.  
CS Chem. & Tech. Div., Palm Oil Res. Inst. of Malaysia, PO Box 10, 620 50720  
Kuala Lumpur, Malaysia. E-mail aini(a)porim.gov.my

SO Journal of the American Oil Chemists' Society, (1999), 76 (5) 643-648, 13  
ref.

ISSN: 0003-021X

DT Journal

LA English

AB Physical and chemical characteristics of vanaspati, an all vegetable  
oil-based alternative to ghee, were investigated. 8 samples of  
**trans-free** vanaspati were constructed from palm  
oil-palm stearin-palm olein (PO-PO.sub.s-PO.sub.o) blends (set A,  
4 samples) and palm oil-palm stearin-palm kernel olein  
(PO-PO.sub.s-PKO.sub.o) blends (set B, 4 samples). Iodine values (IV)  
were palm stearin = 30 and soft palm stearin = 44. Most vanaspati samples  
were grainy with a shiny appearance. Chemical analyses indicated that  
PO-PO.sub.s-PO.sub.o vanaspati had higher IV (47.7-52.4) than  
PO-PO.sub.s-PKO.sub.o (IV 37.5-47.3). Higher IV demonstrated by set A  
samples was caused by higher content of unsaturated fatty acids,  
46.0-50.0% compared to set B (36.6-45.0%). Decreasing palm oil  
levels and increasing palm stearin levels caused higher slip melting  
points and higher yield values. Eutectic interactions were observed in  
PO-PO.sub.s-PKO.sub.o blends; PO-PO.sub.s.sub.-PO.sub.o samples were  
predominantly B'-crystalline in form, although 1 set B sample demonstrated  
.beta.-crystallinity. Set B DSC thermograms had a high peak at the  
low-melting region and a high peak at the high-melting region; set A had a  
lower peak at the low-melting region. [From En summ.]

CC N (Fats, Oils and Margarine)

CT FATS VEGETABLE; PALM OILS; PHYSICAL PROPERTIES; PHYSICOCHEMICAL  
PROPERTIES; VANASPATI

L6 ANSWER 24 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1999(11):K0186 FSTA

TI Chocolate spreads can be made more healthy.

AU Anon.

SO Confectionery Production, (1999), 65 (5) 14-15  
ISSN: 0010-5473

DT Journal

LA English

AB Traditional chocolate spreads contain relatively high levels of  
**trans** fatty acids (TFA), which increase plasma lipoprotein levels  
and pose a health risk in terms of cardiovascular disease. Development of  
a method (Gruenau, Germany) for production of chocolate spreads with  
virtually no TFA and high product appeal is described. The method is  
based on use of special mono- and diglycerides (Kirlol) blended with  
liquid vegetable oils to achieve the required consistency and enables  
costs of production to be reduced and production security and flexibility  
to be increased. Production involves melting of Kirlol at 65.degree.C in  
oil, addition of lecithin or Polymuls PGPR and blending of sugar,  
skim milk and cocoa powder; total mass is refined in a roller drum system.  
**Spread** viscosity is reduced using emulsifiers while addition of  
Kirlol SV 45 produces spreadable products with 28-32% oil and no  
separation. Labelling issues (e.g. of emulsifying systems) and marketing  
ideas to increase product appeal (e.g. as a tooth friendly/sugar

**free**, prebiotic, dietetic, sports/slimming product) are also discussed.

CC K (Cocoa and Chocolate and Sugar Confectionery Products)  
CT CHOCOLATE PRODUCTS; EMULSIFIERS; FATTY ACIDS; GLYCERIDES; MONOGLYCERIDES;  
SPREADS; DIACYLGLYCEROLS; MONOACYLGLYCEROLS; TRANS FATTY ACIDS  
TN Gruenau; Kirnol SV 45

L6 ANSWER 25 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1999(09):N0527 FSTA

TI Enzymatic interesterification of blends of liquid and totally hydrogenated fats to obtain the **margarine** base stocks of minimal content of trans isomers.

AU Ledochowska, E.

CS Katedra Tech. i Chem. Tluszczow, Politech. Gdanska, ul. G. Narutowicza 11/12, 80-952 Gdansk, Poland. Tel. (48 58) 3471723. Fax (48 58) 3472694. E-mail pawlowicz(a)chem.pg.gda.pl

SO Polish Journal of Food and Nutrition Sciences, (1999), 8/49 (1) 65-76, 27 ref.

DT Journal

LA English

SL Polish

AB [Enzymic interesterification of blends of liquid and totally hydrogenated fats was examined as a method to produce **margarine** base stocks with minimal contents of **trans** fatty acids.] 4 fat mixtures, composed of various combinations of rapeseed **oil**, palm **oil** and totally hydrogenated soybean **oil**, were interesterified. Products were separated by column chromatography into a non-polar fraction (containing triacylglycerols) and a polar fraction (containing **free** fatty acids and di- and monoacylglycerols). The wt. percentages of the fractions were determined. Percentages of particular components in the polar fraction were examined by high-performance size-exclusion chromatography (HPSEC). Interesterified products were found to have considerably less solid phase and lower melting temp. than initial blends. Crystal form was also improved; initial blends crystallized in the .beta. form whereas products of interesterification tended to crystallize in the .beta.' form. Content of **trans** isomers in all reaction products was minimal accounting for approx. 2%. It is concluded that enzymic interesterification allows production of a solid fat with a minimal content of **trans** fatty acids and useful functional properties.

CC N (Fats, Oils and Margarine)

CT ESTERIFICATION; FATTY ACIDS; FUNCTIONAL PROPERTIES; ISOMERS; MARGARINES; INTERESTERIFICATION

L6 ANSWER 26 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1998(10):N0471 FSTA

TI Physical and chemical properties of **trans-free** fats produced by chemical interesterification of vegetable **oil** blends.

AU Petrauskaite, V.; Greyt, W. de; Kellens, M.; Huyghebaert, A.

CS Dep. of Food Tech. & Nutr., Coupure Links 653, B-9000 Ghent, Belgium. E-mail Vaida.Petrauskaite(a)rug.ac.be

SO Journal of the American Oil Chemists' Society, (1998), 75 (4) 489-493, 20 ref.

ISSN: 0003-021X

DT Journal

LA English

AB Interesterification of a highly saturated fat such as palm stearin (PST) or fully hydrogenated soybean **oil** (FHSBO) with a native soybean **oil** to produce fat blends containing minimal trans fatty acids (TFA) and demonstrating melting characteristics similar to those of commercial fats was investigated. PST or FHSBO were used as hard stocks,

with their contents varying from 10-75% in blends with native soybean oil. Interesterified fat blends containing 30-50% of hard stock showed plasticity curves similar to those of commercial shortenings and stick margarines; fat blends containing 20% hard stock demonstrated properties similar to tub margarines, while fat blends containing 40% PST or 25% FHSBO were similar to confectionery fat basestocks. TFA levels in interesterified fat blends measured 0.1% in comparison with commercial fats which contained TFA levels ranging from 1.3-12.1%.

CC N (Fats, Oils and Margarine)  
CT ESTERIFICATION; FATS VEGETABLE; FATTY ACIDS; OILS VEGETABLE;  
INTERESTERIFICATION; TRANS FATTY ACIDS; VEGETABLE FATS; VEGETABLE OILS

L6 ANSWER 27 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1998(07):Q0124 FSTA

TI Contents of carotenoids and retinol in hens' eggs.

AU Majchrzak, D.; Elmadfa, I.

CS Inst. fuer Ernahrungswissenschaften, Univ. Wien, Vienna, Austria

SO Fett/Lipid, (1997), 99 (10) 365-368, 25 ref.

ISSN: 0931-5985

DT Journal

LA German

SL English

AB Eggs of 6 commercially available types (summer **free** range eggs; winter **free** range eggs; floor system eggs; eggs laid by hens fed a 4-grain diet; battery hen eggs; and eggs with a high docosahexaenoic acid concn.) and batches of eggs laid by hens on experimental diets (a fish oil diet or a linseed oil diet) were analysed for carotenoids and retinol. Data are presented for concn. of all-**trans** retinol, .beta.-carotene, .alpha.-carotene, cryptoxanthin, lutein, zeaxanthin, canthaxanthin, lycopene and .beta.-apocarotenoid acid ethyl ester in the eggs. **Free** range eggs, especially summer **free** range eggs, had the highest contents of retinol and most of the carotenoids. Eggs laid by hens fed the 2 experimental diets had normal retinol concn., but very low concn. of other carotenoids except for canthaxanthin and .beta.-apocarotenoid acid ethyl ester, which were used as feed additives. For all eggs, concn. of provitamin A carotenoids were low, and would contribute only up to 1.2% to total retinol equivalent concn.

CC Q (Eggs and Egg Products)

CT CAROTENOIDS; EGGS; RETINOLS; RETINOL

L6 ANSWER 28 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1998(04):N0163 FSTA

TI Chemometric analysis of mass spectra of cis and trans fatty acid picolinyl esters.

AU Leth, T.

CS Nat. Food Agency, Inst. of Food Chem. & Nutr., Morkhoj Bygade 19, DK-2860 Soborg, Denmark

SO Zeitschrift fuer Lebensmittel-Untersuchung und-Forschung A/Food Research and Technology, (1997), 205 (2) 111-115, 5 ref.  
ISSN: 1431-4630

DT Journal

LA English

AB Use of GC-MS techniques to elucidate the cis or **trans** configuration of picolinyl esters of fatty acids was investigated; detection of **trans** fatty acids is important following recent health concerns regarding presence of these compounds in **margarine**, shortenings and certain frying fats. Picolinyl esters of fatty acids were prepared by adding carbonyl-diimidazole, 3-hydroxymethylpyridine and 4-pyrrolidin-o-pyridine to a solution of **free** fatty acids in dichloromethane. The picolinyl esters dissolved in heptane were then separated by capillary GC on a CP Sil 88 column equipped with a quadropole

MS-detector. Mass spectra clearly showed mol. wt. and position of double bonds in the fatty acids, although it was impossible to discern visually whether the configuration was *cis* or *trans*. Use of principal component analysis, however, made it possible to distinguish between *cis* and *trans* fatty acids of C16:1, C18:1 n-9, C18:1 n-12, C18:2 and C22:1 in 2- and 3-dimensional score plots. With Soft Independent Modelling of Class Analogy (SIMCA), it was possible to calculate models that could predict from the mass spectra of unknown fatty acids whether they were of the *cis* or *trans* configuration, which was demonstrated for C18:1 *trans* from hardened *margarine* and butter. [From En summ.]

CC N (Fats, Oils and Margarine)  
CT FATS; FATTY ACIDS; GAS CHROMATOGRAPHY; ISOMERS; MASS SPECTROSCOPY; GC MS

L6 ANSWER 29 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1997(09):N0040 FSTA

TI Trends in transesterification of cottonseed oil.  
AU Hernandez, E.; Lusas, E. W.

CS Food Protein R&D Cent., Texas A&M Univ., College Station, TX 77843, USA  
SO Food Technology, (1997), 51 (5) 72, 74-76, 17 ref.

ISSN: 0015-6639  
DT Journal  
LA English

AB Health concerns about the presence of *trans* fatty acids in hydrogenated fats have generated a demand for nonhydrogenated solid fats which are *free* of these fatty acids. The possibility of producing viable sources of nonhydrogenated solid fats from cottonseed oil using winterization (chill fractionation) is discussed. Aspects considered include: practicability of use of winterization for vegetable oils in general; use of solvents such as hexane and acetone as winterizing agents in processing of cottonseed oil; interesterification of fats and oils (use of lipases and sodium methoxide); interesterification of solid fats (development of cocoa butter substitutes); directed interesterification of cottonseed oil; evaluation of the solid fats produced by directed interesterification of cottonseed oil; and use of directed interesterification technology to produce high-melting cottonseed stearins suitable as components of *margarine* spreads.

CC N (Fats, Oils and Margarine)  
CT COTTONSEED OILS; ESTERIFICATION; OILS; PROCESSING; VEGETABLE PRODUCTS; WINTERIZATION; INTERESTERIFICATION

L6 ANSWER 30 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1997(09):N0031 FSTA

TI Heat stability of milkfat in relation to vegetable oils.  
AU Harmer, W. R.; Wijesundera, C.

CS CSIRO Div. of Food Sci. & Tech., Melbourne Lab., Graham Rd., Highett, Vic. 3190, Australia  
SO Australian Journal of Dairy Technology, (1996), 51 (2) 108-111, 11 ref.

ISSN: 0004-9433  
DT Journal  
LA English

AB Milkfat, one of its liquid fractions (olein fraction at 13.degree.C, 00.sub.1.sub.3) and 3 vegetable oils (sunflower, canola and linola) were each used to fry potato chips under laboratory conditions intended to simulate commercial frying. A number of measurements were carried out to determine the relative stabilities of each fat towards oxidative and thermal deterioration under deep frying conditions. These included measurements of *free* fatty acids, dielectric constant, viscosity, colour, peroxide value, % polar compounds, total *trans* fatty acid concent, cyclic fatty acid monomers, dimeric, trimeric and polymeric triacylglycerols, dimeric, trimeric and polymeric fatty acids

and geometric isomers of unsaturated fatty acids. Sunflower oil degradation was most pronounced by most measurements, followed by linola oil. Little differentiation was determined between heated milkfat, milkfat fraction OO.sub.1.sub.3 or canola oil in terms of frying induced degradation. Identical heat stability measurements were carried out on 5% and 10% blends of milkfat fraction OO.sub.1.sub.3 in sunflower oil. The heat stability of sunflower oil was improved nonlinearly by the inclusion of OO.sub.1.sub.3 and, in some measurements, the stability exceeded that of the individual oils.

CC N (Fats, Oils and Margarine)

CT FATS; FATS MILK; OILS; OILS VEGETABLE; PHYSICAL PROPERTIES; SUNFLOWER OILS; THERMOPHYSICAL PROPERTIES; VEGETABLE PRODUCTS; HEAT STABILITY; MILK FATS; VEGETABLE OILS

L6 ANSWER 31 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1997(09):N0017 FSTA

TI Utilization of high-melting palm stearin in lipase-catalyzed interesterification with liquid oils.

AU Ghosh, S.; Bhattacharyya, D. K.

CS Correspondence (Reprint) address, D. K. Bhattacharyya, Dep. of Chem. Tech., Univ. Coll. of Sci. & Tech., Calcutta Univ., Calcutta 700 009, India

SO Journal of the American Oil Chemists' Society, (1997), 74 (5) 589-592, 12 ref.

ISSN: 0003-021X

DT Journal

LA English

AB The higher-melting point fraction of palm stearin (HMPS), with a m.p. of approx. 58.degree.C, cannot be used in fat based products because of its m.p. Modification of this fraction by lipase catalysed interesterification with other liquid oils may make it suitable for such uses. HMPS was interesterified using a range of liquid oils, including sunflower, soybean and rice bran oils, to produce material suitable for manufacture of **trans-free** shortening and **margarine**. Mucor miehei lipase was used for the esterification. Physical properties of the interesterified products were analysed.

CC N (Fats, Oils and Margarine)

CT ENZYMES; ESTERIFICATION; ESTERS; LIPASES; LIPIDS; OILS; OILS VEGETABLE; PALM OILS; TRIGLYCERIDES; VEGETABLE PRODUCTS; INTERESTERIFICATION; STEARIN; VEGETABLE OILS

L6 ANSWER 32 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1996(12):N0042 FSTA

TI [Olive oil quality and EC regulations.] Olivenoelqualitaet und EG-Regelungen.

AU Fiebig, H. J.

CS Inst. fuer Chemie und Physik der Fette, Bundesanstalt fuer Getreide-, Kartoffel- und Fettforschung, D-48147 Muenster, Germany

SO Deutsche Lebensmittel-Rundschau, (1995), 91 (7) 214-218, 20 ref. ISSN: 0012-0413

DT Journal

LA German

SL English

AB EC regulations for olive oil are discussed with reference to: classification of olive oils; customs duties; determination of **free** fatty acids; determination of peroxide number; capillary GC determination of waxes and sterols; determination of erythrodiol and uvaol; determination of fatty acids at the 2-position of triglycerides; determination of trilinolein; UV spectrophotometric analysis; GC analysis of fatty acid methyl esters, including **trans** isomers; determination of residues of volatile halogenated solvents; sensory testing of olive oils; determination of stigmastadienes; and other

national and international regulations for olive oil.

CC N (Fats, Oils and Margarine)  
 CT OILS; OLIVE OILS; VEGETABLE PRODUCTS; EUROPEAN COMMUNITY; REGULATIONS

L6 ANSWER 33 OF 73 FSTA COPYRIGHT 2002 IFIS  
 AN 1996(10):N0062 FSTA  
 TI Production of high quality fish oils.  
 AU Vinter, H.  
 CS SCI Oils & Fats Group Fish Oil Symposium; Aarhus Oliefabrik A/S, PO Box  
 50, DK-8100 Aarhus C, Denmark  
 SO (1995), Fish oil: technology, nutrition and marketing, pp. 27-33 ISBN  
 0-9526542-0-2  
 DT Conference  
 LA English  
 AB Problems arising from oxidation of fish oils (reduction in levels of  
 long-chain .omega.-3 polyunsaturated fatty acids and production of  
**free** radicals) are discussed, and development of unhardened, high  
 quality fish oil (totox value <2, undetectable polymer levels,  
 no **trans** fatty acid formation and high oxidative resistance) is  
 described. Continuing problems in quality of commercial cod liver oils are  
 highlighted. [Abstracts of further papers from this symposium are included  
 in electronic formats of the FSTA database and may be traced via the  
 corporate authors (CA) field, under SCI Oils & Fats Group [Fish  
 Oil Symposium]. See also FSTA (1996) 28 10N52.]

CC N (Fats, Oils and Margarine)  
 CT OILS; OILS FISH; OXIDATION; SEA FOODS; FISH OILS

L6 ANSWER 34 OF 73 FSTA COPYRIGHT 2002 IFIS  
 AN 1996(10):N0038 FSTA  
 TI Designer oils for better nutrition.  
 AU Kinney, A. J.  
 CS DuPont Experimental Station, PO Box 80402, Wilmington, DE 19880-0402, USA.  
 E-mail kinneya(a)al.esvax.umc.dupont.com  
 SO Nature Biotechnology, (1996), 14 (8) 946, 11 ref.  
 ISSN: 1087-0156  
 DT Journal  
 LA English  
 AB Genetic engineering of the fatty acid composition of plants is discussed;  
 this technology is now a practical option, and it is possible to redesign  
 the fatty acid profiles of plant membranes or plant storage oils. Recently  
 published work in this area of research is described, and in particular,  
 the expression of a cyanobacterial desaturase gene in transgenic tobacco  
 which results in the introduction of a double bond in the .DELTA.9  
 position of C16 and C18 saturated fatty acids is considered [see FSTA  
 (1996) 28 10B71]. Introduction of this double bond in tobacco plants  
 causes a significant reduction in saturates in both leaf and root tissues  
 and this is correlated with an increased chilling resistance of the  
 plants. Genetic engineering work aimed at improving the nutritional  
 quality of plant oils is also described. Examples include: expression of  
 .DELTA.9 desaturases in seeds as a possible mechanism for reducing the  
 saturates content of vegetable oils; expression of .DELTA.6 desaturases in  
 plant seeds to produce .gamma.-linolenic acid; suppression of endogenous  
 plant desaturases (.OMEGA.6 desaturase in soybeans and .DELTA.9 desaturase  
 in rapeseeds) which favours the production of oils **free** from  
**trans**-fatty acids; expression of acyl-ACP (acyl carrier protein)  
 thioesterase genes in rapeseeds to produce high laurate rapeseed oils -  
 these are currently sold for use in non-dairy creamers and confectionery  
 coatings as a nutritionally improved substitute for palm kernel  
 oil; isolation of thioesterases with activity towards C8 and C10  
 acyl-ACP; and protein engineering to modify the specificity of  
 thioesterases.

CC N (Fats, Oils and Margarine)

CT ENZYMES; GENE EXPRESSION; GENETICS; OILS; OILS VEGETABLE; VEGETABLE PRODUCTS; MODIFICATION; VEGETABLE OILS

L6 ANSWER 35 OF 73 FSTA COPYRIGHT 2002 IFIS  
 AN 1996(10):N0033 FSTA  
 TI Comparative nutritional quality of palmstearin-liquid oil blends and hydrogenated fat (vanaspati).  
 AU Ray, S.; Bhattacharyya, D. K.  
 CS Correspondence (Reprint) address, D. K. Bhattacharyya, Dep. of Chem. Tech., Calcutta Univ., Univ. Coll. of Sci. & Tech., Calcutta 700 009, India  
 SO Journal of the American Oil Chemists' Society, (1996), 73 (5) 617-622, 29 ref.  
 ISSN: 0003-021X  
 DT Journal  
 LA English  
 AB An attempt was made to use high-melting low-digestible fat palmstearin as a vanaspati substitute by blending it with polyunsaturated fatty acid-rich oils. This blending produced fat products of zero-trans fatty acid content and m.p. below the human body temp., so that they can be digested easily. The new blended products were fed to male albino rats (Charles Foster strain); the coeff. of digestibilities were 94.2% for palmstearin and rapeseed oil blend, 95.1% for palmstearin and sunflower oil blend, and 96.2% for palmstearin and soybean oil blend, which were somewhat better than the digestibility coeff. of conventional vanaspati (93.6%). Feeding experiments for 3 months showed comparable results in terms of serum lipid profiles. The blended products significantly increased the total cholesterol level, but not the free cholesterol level, in serum and liver of rats when compared with those of the conventional vanaspati group of rats.

CC N (Fats, Oils and Margarine)  
 CT FATS; FATS VEGETABLE; NUTRITIONAL VALUES; VEGETABLE PRODUCTS; VANASPATI

L6 ANSWER 36 OF 73 FSTA COPYRIGHT 2002 IFIS  
 AN 1996(10):N0027 FSTA  
 TI Preparation of modified fats from vegetable oil and fully hydrogenated vegetable oil by randomization with alkali catalysts.  
 AU Schmidt, S.; Hurtova, S.; Zemanovic, J.; Sekretar, S.; Simon, P.; Ainsworth, P.  
 CS Dep. of Milk, Fat & Food Hygiene, Fac. of Chem. Tech., Slovak Tech. Univ., 812 37 Bratislava, Slovakia  
 SO Food Chemistry, (1996), 55 (4) 343-348, 13 ref.  
 ISSN: 0308-8146  
 DT Journal  
 LA English  
 AB Randomization of fat blends for use in margarines, formulated by mixing vegetable oil (VO) with fully hydrogenated vegetable oil (FHVO) in various ratios using alkali catalysts (sodium hydroxide and sodium methoxide) was investigated using HPLC. The relationship between the structure and physical properties of fat blends was examined using pulsed NMR (p-NMR) and DSC. The fatty acid and triacylglycerol composition of each original fat blend and the randomization products together with physical properties such as melting, crystallization characteristics and solid fat content were correlated. Differences in the exothermic and endothermic peak temp., m.p. and solid fat content among the fat blends showed the effects of the composition on the physical properties. Randomized fat blends of m.p. 34-37.degree.C (VO:hydrogenated vegetable oil of 2.6:1 or 3:1) have applications in preparation of trans-isomer-free margarines. Products of m.p. 38-42.degree.C (VO:FHVO of 2:1 or 2.2:1) have applications as replacements for lard in frying media. It is concluded that randomization using sodium

hydroxide can produce fat blends suitable for **margarine** production with a **trans** content <5%. [From En summ.]

CC N (Fats, Oils and Margarine)  
CT ESTERIFICATION; FATS; LIPIDS; OILS; OILS VEGETABLE; VEGETABLE PRODUCTS;  
INTERESTERIFICATION; VEGETABLE OILS

L6 ANSWER 37 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1996(07):N0036 FSTA

TI Effect of mixing leaves with olives on organoleptic quality of **oil** obtained by centrifugation.

AU Giovacchino, L. di; Angerosa, F.; Giacinto, L. di

CS Istituto Sperimentale per la Elaiotecnica, Viale Petruzzi, 37, 65013 Citta S. Angelo (PE), Italy

SO Journal of the American Oil Chemists' Society, (1996), 73 (3) 371-374, 14 ref.

ISSN: 0003-021X

DT Journal

LA English

AB Effects of leaves (0-5% wt/wt), added to ripe olives, on properties of the resulting olive **oil** were investigated. **Free** acidity, peroxide values and UV absorptions of oils were not affected by addition of leaves. Addition of 1-3% wt/wt leaves improved sensory properties of the **oil**. Chemical analysis of oils indicated that **trans** -2-hexenal was responsible for the increased 'freshly cut grass' note present in these oils. Addition of leaves to olives did not cause any mechanical problems during extraction.

CC N (Fats, Oils and Margarine)

CT OILS; OLIVE OILS; PLANTS; VEGETABLE PRODUCTS

L6 ANSWER 38 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1996(04):N0023 FSTA

TI Preparation and characterization of a zero-trans **margarine**.

AU Mohamed, H. M. A.; Iskandar, M. H.; Sivik, B.; Larsson, K.

CS Dep. of Food Sci. & Tech., Fac. of Agric., Minia Univ., El-Minia, Egypt

SO Fett Wissenschaft Technologie, (1995), 97 (9) 336-340, 23 ref.

ISSN: 0931-5985

DT Journal

LA English

SL German

AB Studies were conducted on manufacture and properties of 2 new margarines: a milk-flavour **free margarine** based on 40% partially hydrogenated cottonseed **oil** (m.p. 42.2.degree.C), 40 % non-hydrogenated cottonseed **oil** and 20% olive **oil** as a flavour ingredient; and a **trans** fatty acid **free margarine** based on a fat produced by lipase interesterification of a mixture of 86.5% cottonseed **oil** with 13.5% fully hydrogenated soybean **oil** (m.p. 67.2.degree.C). These margarines were compared with a commercial soybean **oil** based **margarine**. Fatty acid composition, fat polymorphic state and solid fat contents were determined. The **trans** fatty acid **free margarine** had properties very similar to those of conventional soft margarines. The **margarine** containing 20% olive **oil** showed good acceptability.

CC N (Fats, Oils and Margarine)

CT FATS; MARGARINES

L6 ANSWER 39 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1995(11):N0041 FSTA

TI The palm **oil** situation in South East Asia.

AU Basiron, Y; Abdullah, R.

CS Palm Oil Res. Inst. of Malaysia (PORIM), PO Box 10620, 50720 Kuala Lumpur, Malaysia

SO INFORM, (1995), 6 (8) 891-892, 894  
ISSN: 0897-8026

DT Journal  
LA English

AB South East Asia is a major supplier of palm and lauric oils; in 1994 palm oil from the region accounted for 32% of the world trade in oils and fats. Production and trade of palm oil in the region are discussed. Aspects considered include: production (world palm oil production 1970-1994, predictability of supplies, cyclic nature of yields, comparisons with production of other oilseeds); exports from South East Asia (demand and prices, share of world trade, growth markets, demand for use in **trans**-fatty acid **free** products); and prospects for 1995 (stocks and pricing, Malaysian and Indonesian production, trade barriers on palm oil imports). It is suggested that high lauric oil prices may motivate Indonesia to export coconut oil and consume more palm oil locally; the consequent reduction in palm oil availability should strengthen international prices for 1995.

CC N (Fats, Oils and Margarine)  
CT ECONOMICS; OILS; PALM OILS; VEGETABLE PRODUCTS; ASIA

L6 ANSWER 40 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1995(10):N0058 FSTA

TI Quality characteristics for cold pressed edible oils.  
Qualitaetsmerkmale kaltgepresster Speiseoel.

AU Bruehl, L.; Fiebig, H. J.

CS Inst. fuer Chemie und Physik der Fette, Bundesanstalt fuer Getreide,  
Kartoffel- und Fettforschung, Piusallee 76, D-48147 Muenster, Germany

SO Fett Wissenschaft Technologie, (1995), 97 (6) 203-208, 19 ref.  
ISSN: 0931-5985

DT Journal  
LA German  
SL English

AB Studies were conducted on assessment of authenticity of cold pressed vegetable oils on the basis of determination of steradienes (by GC or HPLC), **trans**-fatty acids, **free** fatty acids, or UV absorption at 232 or 270 nm. Application of these techniques to assessment of 24 vegetable oils is reported. Results show that data for steradienes and **trans**-fatty acids are a useful guide to authenticity of cold pressed oils; **free** fatty acids and UV absorption data provide only ambiguous information. Many samples of oil described as cold pressed showed analytical data suggesting either thermal processing or blending with refined oils. Nomenclature and labelling of cold pressed vegetable oils are discussed.

CC N (Fats, Oils and Margarine)  
CT OILS; OILS VEGETABLE; PURITY; VEGETABLE PRODUCTS; AUTHENTICITY; VEGETABLE OILS

L6 ANSWER 41 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1994(04):N0012 FSTA

TI Aroma of virgin olive oil: biogenesis of the green odor notes.

AU Olias, J. M.; Perez, A. G.; Rios, J. J.; Sanz, L. C.

CS UEI Fisiologia y Tecnologia Post-recoleccion, Inst. de la Grasa y sus Derivados, CSIC, Avenida Padre Garcia Tejero 4, 41012 Seville, Spain

SO Journal of Agricultural and Food Chemistry, (1993), 41 (12) 2368-2373, 42 ref.  
ISSN: 0021-8561

DT Journal  
LA English

AB Evidence for the involvement of an enzymic system in the formation of green (unripe) odours including hexenal, *cis*-3-hexenal and **trans**-2-hexenal and corresponding esters is presented. Acylhydrolase,

lipoxygenase and fatty acid hydroperoxide lyase activities were found in cell-free extract of olive fruit. Triacylglycerols and phospholipids were hydrolysed to free fatty acid, mainly polyunsaturated, by acylhydrolase. From linoleic and linolenic acids 9- and 13-hydroperoxides were formed by lipoxygenase. The lyase cleaved the 13-hydroperoxides of linoleic and linolenic acids to form the volatile aldehydes hexanal and cis-3-hexenal, respectively; enzyme did not act on 9-hydroperoxides of the acids. Biological conversion of hexanal and trans-2-hexenal to corresponding alcohols resulted when the carbonyl compounds were incubated with disks of ripe olive fruit tissue. Hexyl alcohols were converted to their acetate esters during incubation with olive fruit tissue. A sequential enzymic pathway for formation of green aroma compounds in virgin olive oil is proposed. [From En summ.]

CC N (Fats, Oils and Margarine)

CT AROMA COMPOUNDS; OILS; OLIVE OILS; VEGETABLE PRODUCTS; VOLATILE COMPOUNDS

L6 ANSWER 42 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1993(12):S0109 FSTA

TI Influence of frying and microwave treatment on the vitamin A content of livers of turkeys.

AU Matthey, M.; Graf, H.; Luedke, C.; Flachowsky, G.; Federation of European Chemical Societies [Nutrient Bioavailability Symposium]

CS Fac. of Biol., Inst. of Nutr. & Environment, Friedrich-Schiller-Univ. Jena,, D-O-6900 Jena, Germany

SO (1993), Part II, pp. 408-411; Bioavailability '93 - nutritional, chemical and food processing implications of nutrient availability. ISSN 0933-5463, 17 ref.

ISSN: 0933-5463

DT Conference

LA English

AB Effects of frying and microwaving on vitamin A content of turkey livers were investigated. Livers (mean wt. 140 g) were obtained from 10 male turkeys slaughtered at 12 kg wt. Turkey feed had been supplemented with decreasing quantities of vitamin A (18 000 to 15 000 IU/kg feed) during the growing period. Fresh liver samples were (i) homogenized (untreated); (ii) fried for 4 min in boiling sunflower oil (free of vitamin A); or (iii) microwaved for 1 min. Vitamin A content of liver samples was determined as retinol using HPLC. Frying and microwaving increased the DM content of liver from 27.13 (untreated) to 32.4 and 37%, respectively. Vitamin A content of liver increased from 1363 (untreated) to 1586 (fried) and 1784 (microwaved) IU vitamin A/g liver as a result of the higher DM content. Based on the original DM content, frying and microwaving had no significant effect on vitamin A content of liver. Microwaving increased the % of 13-cis-isomers (from 3.0 to 4.5%) and 9,13,di-cis-isomers (from 0.4 to 0.7%) in the total retinol content ( $P < 0.05$ ). Microwaving resulted in a decrease in the % of all trans-retinol from 96.5 to 94.8. This is 1 of 45 abstracts sourced from the symposium 'Bioavailability '93 - nutritional, chemical and food processing implications of nutrient availability'; the other abstracts (plus an overall descriptive abstract) may be traced via the author index under Federation of European Chemical Societies [Nutrient Bioavailability Symposium].

CC S (Meat, Poultry and Game)

CT COOKING; FRYING; LIVERS; MICROWAVES; OFFAL; POULTRY; PROCESSING; RETINOLS; TURKEYS; TURKEY; VITAMIN A

L6 ANSWER 43 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1993(09):A0004 FSTA

TI Comparison of methylation methods for the quantitation of conjugated linoleic acid isomers.

AU Shantha, N. C.; Decker, E. A.; Hennig, B.

CS Food Sci. Sect., Dep. of Animal Sci., Univ. of Kentucky, Lexington, KY  
40546-0215, USA  
SO Journal of the AOAC International, (1993), 76 (3) 644-649, 37 ref.  
ISSN: 1060-3271  
DT Journal  
LA English  
AB Four methylation methods were evaluated for use in the GC quantitation of conjugated linoleic acid (CLA) isomers, which are potential anticarcinogens. Methods were: sodium methoxide in methanol (NaOMe-MeOH); American Oil Chemists' Society (AOCS) procedure Ce 2-66, which involves methanolic sodium hydroxide followed by boron trifluoride in methanol; tetramethylguanidine in methanol (TMG-MeOH); and direct transesterification with methanol-benzene-acetyl chloride (DAC). Purified methyl esters of isomerized linoleic acid containing 86% CLA isomers were methylated and analysed by GC. The AOCS and DAC methods resulted in 3 and 50% losses in cis-9,trans-11-octadecadienoic acid (9c, 11t CLA isomer) and trans-10,cis-12 octadecadienoic acid (10t, 12c CLA isomers), respectively. Compared with the control, the AOCS and DAC methods increased the yield of trans,trans CLA isomers (trans-9,trans-11 and trans-10,trans-12-octadecadienoic acid) by 1.07-fold and 10-fold, respectively. A non-CLA artifact that eluted close to CLA peaks was formed during methylation by the AOCS and DAC methods. It is concluded that the DAC and AOCS methods are not suitable for quantitation of CLA isomers. The NaOMe-MeOH and TMG-MeOH methods, however, are suitable for quantitation of CLA isomers in fats containing low concn. of free fatty acids.  
CC A (Food Sciences)  
CT ANALYTICAL TECHNIQUES; FATTY ACIDS; GAS CHROMATOGRAPHY; ISOMERS; LINOLEIC ACID; GC

L6 ANSWER 44 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1993(06):N0038 FSTA  
TI Food product formulation to minimize the content of hydrogenated fats.  
AU Berger, K.  
CS 17 Grosvenor Road, London W4 4EQ, UK  
SO Lipid Technology, (1993), 5 (2) 37-40, 13 ref.  
ISSN: 0956-666X  
DT Journal  
LA English  
AB Most of the trans-fatty acid content of the human diet is derived from partial hydrogenation of fats. Following consideration of recent research that suggests that the amount of trans-fatty acids in the diet should be minimized, use of palm oil products as an alternative source of solid fat, free from trans-fatty acids, is discussed. Consideration is given to the formulation and use of products such as palm oil, olein and stearin for removing or minimizing the need for hydrogenated fats in vanaspati, bakery shortenings, margarines and confectionery fats.  
CC N (Fats, Oils and Margarine)  
CT OILS; PALM OILS; VEGETABLE PRODUCTS; FOODS

L6 ANSWER 45 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1993(05):N0019 FSTA  
TI Determination of low level trans unsaturation in fats by Fourier Transform infrared spectroscopy.  
AU Ulberth, F.; Haider, H. J.  
CS Dep. of Dairy Res. & Bacteriol., Agric. Univ., A-1180 Vienna, Austria  
SO Journal of Food Science, (1992), 57 (6) 1444-1447, 14 ref.  
ISSN: 0022-1147  
DT Journal  
LA English  
AB Fourier Transform infrared spectroscopy (FTIR) was an excellent tool for

rapid determination of **trans** unsaturation in edible fats. Methyl esters were determined as a neat solution, thereby avoiding cumbersome weighing operations and handling of CS.sub.2. The method was calibrated by gravimetrically prepared mixtures of methyl elaidat in methyl esters of a **trans** fatty acid (TFA) **free** soybean oil. In contrast to TFA concn. >10%, which could be determined easily by the classic baseline technique, low TFA values were only quantifiable (with high accuracy) after a computer-assisted spectral subtraction procedure.

CC N (Fats, Oils and Margarine)

CT ANALYTICAL TECHNIQUES; FATTY ACIDS; LIPIDS; SOYBEAN OILS; SPECTROSCOPY; VEGETABLE PRODUCTS; IR SPECTROSCOPY; UNSATURATION

L6 ANSWER 46 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1992(04):N0041 FSTA

TI Evaluation of SFC/FT-IR for examination of hydrogenated soybean oil.

AU Calvey, E. M.; McDonald, R. E.; Page, S. W.; Mossoba, M. M.; Taylor, L. T.

CS Correspondence (Reprint) address, L. T. Taylor, Dep. of Chem., Virginia Polytechnic Inst. & State Univ., Blacksburg, VA 24061-0212, USA

SO Journal of Agricultural and Food Chemistry, (1991), 39 (3) 542-548, 32 ref.

ISSN: 0021-8561

DT Journal

LA English

AB Partial hydrogenation of vegetable oils causes isomerization of the unsaturated fatty acids [including formation of **trans** isomers] in the triacylglycerol molecules. Some of these isomers have been shown to cause adverse physiological effects in animal feeding studies. The study reported here evaluates the use of supercritical fluid chromatography (SFC) with flow-cell Fourier transform IR (FT-IR) spectrometry to determine the relative level of unsaturation and the extent of isomerization in partially hydrogenated soybean oil.

**Free** fatty acids (FFAs) from the hydrolysis of soybean oil and the intact triacylglycerols (TGs) of soybean oil were analysed. These compounds can be analysed by SFC using low temp. and similar chromatographic conditions. GC analysis of FFAs and TGs generally requires high temp. and different chromatographic columns. The SFC/FT-IR spectra were compared with the spectra of fatty acid methyl esters by employing GC/matrix isolation/FT-IR.

CC N (Fats, Oils and Margarine)

CT ANALYTICAL TECHNIQUES; FATTY ACIDS; ISOMERIZATION; LIPIDS; OILS; SOYBEAN OILS

L6 ANSWER 47 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1989(02):N0006 FSTA

TI A rapid method for the estimation of isolated **trans** double bonds in oils and fats using Fourier transform infrared spectroscopy combined with attenuated total reflectance.

AU Belton, P. S.; Wilson, R. H.; Sadeghi-Jorabchi, H.; Peers, K. E.

CS AFRC Inst. of Food Res., Norwich Lab., Colney Lane, Norwich NR4 7UA, UK

SO Lebensmittel-Wissenschaft und -Technologie, (1988), 21 (3) 153-157, 11 ref.

ISSN: 0023-6438

DT Journal

LA English

AB The Fourier transform IR spectroscopy-attenuated total reflectance method described has significant advantages over dispersive-transmission methods in terms of convenience, speed of use and rate of sample turnover. The method allows direct analysis of intact samples, eliminates the need for dissolution and filtration and allows digital subtraction of interfering component spectra (e.g. fatty acid), thus eliminating the need for esterification. **Trans** isomer concn. of <2% can be determined by

the method in **free** fatty acid mixtures. The method was successfully applied to a variety of commercial margarines, e.g. one based on sunflower seed **oil** and one containing hydrogenated vegetable and/or marine oils. It should also be possible to use the method for simultaneous detn. and **cis/trans** ratios and peroxidase value.

CC N (Fats, Oils and Margarine)

CT ANALYTICAL TECHNIQUES; FATS; FATTY ACIDS; INFRARED RADIATION; ISOMERS; LIPIDS; MARGARINES; SPECTROSCOPY; FOURIER TRANSFORM; INFRARED; IR;

**MARGARINE**

L6 ANSWER 48 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1988(03):N0011 FSTA

TI [Results of eight years of analyses. Fatty acid composition of edible fats.]

AU Croon, L. B.

CS Naeringslab., Statens Livsmedelsverk, Box 622, S-75126 Uppsala, Sweden

SO Var Foeda, (1987), 39 (1) 2-14, 8 ref.

DT Journal

LA Swedish

SL English

AB Extensive data are given for fatty acid composition of edible fats and oils (margarines, edible oils, etc.) on sale in Sweden. In 4% of margarines and similar spreading fats, the fatty acid composition did not comply with that declared on the label; 20% of edible oils had fatty acid compositions which did not agree with the label declaration. **Trans**-fatty acid content was 1-4% in butterfat-based spreading fats, 5-30% in most margarines, etc. Edible oils and liquid margarines are almost **free** from **trans**-fatty acids. Bakery margarines had **trans**-fatty acids up to 50%. None of the fats or oils studied exceeded Swedish tolerances for erucic acid.

CC N (Fats, Oils and Margarine)

CT FATS; FATTY ACIDS; LABELLING; LIPIDS; MARGARINES; OILS; COMPOSITION; DECLARATION; LABELS; **MARGARINE**

L6 ANSWER 49 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1988(02):N0005 FSTA

TI [Thermal and thermal-catalytic dimerization of the linoleate chain.]

AU Cecchi, G.; Biasini, S.; Ucciani, E.; Perrin, J. L.

CS Unite de Lipochimie ITERG, Lab. de Chimie Organique Appliquee, UA CNRS, 109 Rue Henri Poincare, 13397 Marseille Cedex 13, France

SO Revue Francaise des Corps Gras, (1986), 33 (12) 483-487, 14 ref.

DT Journal

LA French

SL English

AB The chemistry of thermal and catalytic dimerization of linoleate was compared. Catalytic dimerization occurs at <200.degree.C producing aliphatic compounds, thermal dimerization at >250.degree.C producing cyclic compounds and both thermal and catalytic dimerization at 200-300.degree.C ('thermo-catalytic' dimerization). At 300.degree.C, use of an Ru:C catalyst produced a 17-18% increase of dimers/trimers in food-grade grapeseed **oil** and its esters. The thermocatalytic reaction of **free** fatty acids is accompanied by decarboxylation, producing hydrocarbons with odd C numbers (saturated and unsaturated, **cis** and **trans** C.sub.1.sub.5 and C.sub.1.sub.7 straight chain compounds).

CC N (Fats, Oils and Margarine)

CT CATALYSTS; FATTY ACIDS; LINOLEIC ACID; OILS; OILS VEGETABLE; CATALYTIC DIMERIZATION; DIMERIZATION CATALYTIC; GRAPESEED OILS; LINOLEATE

L6 ANSWER 50 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1987(10):N0009 FSTA

TI 79th Annual Meeting.

AU Akoh, C. C.; Swanson, B. G.; Zubillaga, M. P.; Maerker, G.; Hsieh, T. C. Y.; Williams, S. S.; Warinda Vejaphan; Hau, L. B.; Hwang, L. S.; Young, P. K.; Fereshteh Malek; Parvin Zandi; Madacsi, J. P.; Parrish, F. W.; Berni, R. J.; Panford, J. A.; Williams, P. C.; deMan, J. M.; Kassa, P.; Bogdanor, J. M.; Schick, K. G.; Karges, P.; Roy, R. B.; Spyres, G.; Sinram, R. D.; Sleeter, R. T.; Matlock, M.; Shukla, V. K. S.

CS United States of America, American Oil Chemists' Society; PO Box 5037, Sta. A, Champaign, Illinois 61820, USA

SO Journal of the American Oil Chemists' Society, (1987), 64 (5) 597....684

DT Conference

LA English

AB [Continued from preceding abstr.] Preparation of trehalose and sorbitol fatty acid polyesters by interesterification, by Akoh, C. C. & Swanson, B. G. (p. 655). Saponification of cholesteryl esters, by Zubillaga, M. P. & Maerker, G. (p. 655). Volatile components of menhaden fish oil, by Hsieh, T. C. Y., Williams, S. S. & Warinda Vejaphan (p. 655). Quality assessment of oils during heating and frying, by Hau, L. B., Hwang, L. S. & Young, P. K. (p. 655). Determination of gossypol in Iranian cottonseed, cottonseed meal and cottonseed oil, by Fereshteh Malek & Parvin Zandi (p. 655). Using near infrared methodology for measuring oilseed quality, by Madacsi, J. P., Parrish, F. W. & Berni, R. J. (pp. 655-656). Analysis of diverse oilseeds for protein oil and fiber by near infrared reflectance spectroscopy, by Panford, J. A., Williams, P. C. & deMan, J. M. (p. 656). Phosphorus and trace metal analysis by ICP, by Kassa, P. & Bogdanor, J. M. (p. 656). Iodine number utilizing flow injection technology, by Schick, K. G. & Karges, P. (p. 656). Measurement of oil and fat using NIRA procedures, by Roy, R. B. (p. 657). Dynamic headspace analysis of vegetable oils by capillary gas chromatography. Elimination of adsorbent trap, by Spyres, G. (p. 657). Nephelometric AI analysis of fluidized lecithin, by Sinram, R. D. (p. 657). On-line, free fatty acid analyzer utilizing flow injection technology, by Schick, K. G. & Karges, P. (p. 658). Automated quantitative analysis of isolated trans isomers using Fourier transform infrared spectroscopy incorporating improvements in the procedure, by Sleeter, R. T. & Matlock, M. (p. 658). Studies on the crystallization behavior of the confectionery fats by pulse nuclear magnetic resonance employing various tempering modes, by Shukla, V. K. S. (p. 658). [Continued in following abstr.]

CC N (Fats, Oils and Margarine)

CT CHEMISTRY; CONFERENCE PROCEEDINGS; OILS; OIL CHEMISTS; PROCEEDINGS; SOCIETY # AMERICAN

L6 ANSWER 51 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1987(01):N0014 FSTA

TI Changes in physical and chemical properties of shortenings used for commercial deep-fat frying.

AU Smith, L. M.; Clifford, A. J.; Hamblin, C. L.; Creveling, R. K.

CS Dep. of Food Sci. & Tech., Univ. of California, Davis, California 95616, USA

SO Journal of the American Oil Chemists' Society, (1986), 63 (8) 1017-1023, 22 ref.

DT Journal

LA English

AB This study evaluated some of the changes that occur in shortenings used for commercial deep-fat frying in fast-service restaurants. Foods cooked in partially hydrogenated soybean oil were battered chicken parts and French fries. 65 samples of fresh and used shortenings were collected from 9 restaurants on 3 occasions over a 3 month period. Frying periods varied from 0 to 300 h, and most samples were taken just before the used fat was discarded. For fresh shortenings, % of polar materials, free fatty acids (FFA), materials not eluted by GC, and fatty acid profiles differed only slightly. For used samples, there were marked

variations in these analyses and in increases of dielectric constant measurements. Frying times were highly correlated with increases in dielectric constant, polar materials and FFA. The greatest change in fatty acid profiles occurred in **trans**-C18 monoenes which decreased from >40% to as low as 13%. Due to lipid exchange with chicken fat, both oleic and linoleic acids increased in the shortenings with hours of use, whereas stearic acid decreased. There were high correlations among increases in dielectric constant, % of polar materials and FFA, demonstrating that each of these methods could predict degradation of the shortening. However, the increase in dielectric constant, as measured by a Foodoil Sensor (FOS), was the most convenient for quality control in restaurant situations. In most cases, used shortening was discarded before 100 h of frying time; only a few of these samples had FOS readings near 4.0, FFA >1.00%, or % of polar materials >27%. These values have been suggested as discard criteria. However, a number of samples used between 100 and 300 h exceeded these limits. There is a need to specify suitable limits, related to quality and health factors, to determine at what point cooking fat should be discarded.

CC N (Fats, Oils and Margarine)  
CT FRYING; SHORTENINGS; PHYSICOCHEMICAL # USED

L6 ANSWER 52 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1987(01):C0028 FSTA  
TI Analysis for trace amounts of geosmin in water and fish.  
AU Dupuy, H. P.; Flick, G. J., Jr.; St. Angelo, A. J.; Sumrell, G.  
CS Virginia Polytech. Inst. & State Univ., Blacksburg, Virginia, USA  
SO Journal of the American Oil Chemists' Society, (1986), 63 (7) 905-908, 20  
ref.

DT Journal  
LA English

AB Trace amounts of geosmin (**trans**-1,10-dimethyl-**trans**-9-decalol) were concentrated from relatively large vol. of water by vegetable oil extraction. After stirring the 2 phases for 30 min, the dispersed oil was allowed to separate. The oily layer was removed and centrifuged to break the emulsion and separate the 2 layers. Direct GC was used to resolve the geosmin from other volatile components on a capillary GC column. Volatiles were separated from the oil by securing an aliquot of the oil layer on volatile-free glass wool in the glass liner of the special GC inlet system. Geosmin was detected at the p.p.b. level with this simple and rapid technique. A technique was also developed for detecting geosmin in fish tissue [off-flavour catfish studied]; it involves steaming the fish to break up the tissue, centrifuging the residual oil phase, and detecting geosmin by capillary GC. The geosmin remains in the residual oil.

CC C (Hygiene and Toxicology)  
CT ALCOHOLS; FISH; FLAVOUR COMPOUNDS; HETEROCYCLIC COMPOUNDS; VOLATILE COMPOUNDS; WATER; GEOSMIN

L6 ANSWER 53 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1985(12):N0036 FSTA  
TI [Trans fatty acid contents of domestic margarines and shortenings and human sera from healthy young adults.]  
AU Kohno, M.; Cho, Y. J.; Sugano, M.  
CS Dep. of Food Sci. & Tech., Kyushu Univ. School of Agric., Fukuoka, Japan  
SO Journal of Japanese Society of Nutrition and Food Science [Eiyo to Shokuryo], (1982), 35 (3) 217-222, 13 ref.

DT Journal  
LA Japanese  
SL English

AB **Trans**-fatty acid (tFA) contents of 15 margarines for home use, 33 margarines for institutional use, 5 margarines for school feeding, 26

shortenings for institutional use and human sera from healthy young adults were analysed by GLC. The average tFA contents of the margarines were 13.7% for home use, 12.2% for institutional use and 15.5% for school feeding. Shortenings for institutional use averaged 14.3%. The relatively low values for hydrogenated products for institutional use were attributed either to severe hydrogenation or to use of fats scanty in unsaturated fatty acids. tFA contents of total lipids in sera from healthy graduate students taking meals mainly in an university refectory were estimated to be <1%. There was a slight difference in the content of tFA among different lipid classes, the highest value being observed in the **free** fatty acid fraction (mean value 3.1%, range 2-4%).

CC N (Fats, Oils and Margarine)

CT FATTY ACIDS; MARGARINES; SHORTENINGS; FATTY ACIDS-TRANS SURVEY;  
**MARGARINE**

L6 ANSWER 54 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1984(08):N0365 FSTA

TI Rearranged triglycerides and process for making same.

IN Miller, D. E.

PA SCM Corp.

SO United States Patent, (1983)

PI US 4410557

DT Patent

LA English

AB Production of a normally solid triglyceride mixture with enhanced palatability and an SFI at 100.degree. F of <20 is described. It utilizes a blend of a normally liquid solvent derived fraction from a high lauric fat, e.g. palm kernel **oil**, substantially **free** of any combined fatty acid portion having a **trans** configuration, and a stearine fraction derived from a selectively hydrogenated C16-C18 soybean and/or cottonseed **oil** having approx. 20-50% of its combined fat forming acids in a **trans** configuration; the blend is interesterified or randomized.

CC N (Fats, Oils and Margarine)

CT GLYCERIDES; PATENTS; SENSORY PROPERTIES; TRIGLYCERIDES; ENHANCED;  
PALATABILITY; PATENT

L6 ANSWER 55 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1984(01):N0016 FSTA

TI [Isomeric forms of unsaturated fatty acids in edible fats. I. Isomers of octadecanoic acid.]

Untersuchungen ueber isomere Formen ungesaettigter Fettsaeuren in Nahrungsfetten. I. Isomere der Octadecensaure.

AU Renner, E.; Yoon, Y. C.

CS Fachgebiet Milchwissenschaft der Justus-Liebig-Univ., Giessen, Federal Republic of Germany

SO Milchwissenschaft, (1982), 37 (5) 264-266, 33 ref.

DT Journal

LA German

SL English

AB Commercial samples of edible fats (66 margarines, 24 vegetable fats for frying, 47 edible oils and 10 butters) were analysed for contents of isomeric unsaturated fatty acids by the capillary gas chromatographic method described in Milchwissenschaft (1983) 37, 197-199. The **trans** form of octadecanoic acid (elaidinic acid) accounted for an average of 10.3, 5.3, 1.5 and 10.5%, resp., of the total C18:1 fatty acids present in the **margarine**, vegetable fat, edible **oil** and butter samples. Other isomers of octadecanoic acid (not specified) accounted for approx. 6% of the total fat in regular **margarine** and vegetable fat and <1% of butter fat; the edible oils tested were **free** from these isomers. None of the dietetic margarines examined were completely **free** from C18:1 fatty acid isomers.

CC N (Fats, Oils and Margarine)  
CT BUTTER; FATS; FATTY ACIDS; ISOMERS; MARGARINES; OILS; **MARGARINE**;  
OCTADECANOIC ACID; UNSATURATED FATTY ACIDS; UNSATURATION

L6 ANSWER 56 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1983(05):N0226 FSTA

TI Studies on niger (*Guizotia abyssinica*) seed **oil**.

AU Nasirullah, -.; Mallika, T.; Rajalakshmi, S.; Pashupathi, K. S.; Ankaiah,  
K. N.; Vibhakar, S.; Krishnamurthy, M. N.; Nagaraja, K. V.; Kapur, O. P.

CS Analytical Quality Control Lab., Cent. Food Tech. Res. Inst., Mysore-570  
013, India

SO Journal of Food Science and Technology, India, (1982), 19 (4) 147-149, 12  
ref.

DT Journal

LA English

AB 9 niger seed samples collected from Maharashtra and Gujarat (India) were  
analysed. Content of **oil** ranged from 30.0 to 32.4% and protein  
from 26.0 to 30.6%. The range of values for other characteristics were: I  
value, 112.8-129.0; saponification value, 187.0-195.0; **free**  
fatty acid, 0.2-2.0%; butyro-refractometer reading, 59.5-62.2; refractive  
index, 1.4655-1.4673; Bellier turbidity temp., 24.5-27.8.degree. C; and  
unsaponifiable matter, 0.5-1.0%. **Oil** samples were **trans**  
-esterified and fatty acid composition determined by GLC. The saturated  
fatty acids present were: palmitic 5.8-13.0%; stearic 5.0-7.5%; and  
arachidic 0.2-1.0%. Oleic (13.4-39.3%) and linoleic (45.4-65.8%)  
constituted the major fatty acids. UV spectrum of methanol solution of  
niger seed **oil** showed 3 peaks at 256, 260 and 267 nm; the  
possibility of any conjugation was ruled out by the UV spectra of methyl  
esters.

CC N (Fats, Oils and Margarine)

CT FATTY ACIDS; OILS; OILS VEGETABLE; OILSEEDS; COMPOSITION; NIGER; NIGER  
SEED OILS; SEED

L6 ANSWER 57 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1983(03):N0153 FSTA

TI [Chemical and physicochemical characteristics of heated oils: groundnut  
**oil**.]

AU Lorusso, S.; Zelinotti, T.; Betto, P.

CS Univ. di Roma, Rome, Italy

SO Rivista Italiana delle Sostanze Grasse, (1982), 59 (3) 141-148, 17 ref.

DT Journal

LA Italian

SL English

AB Changes in a commercial groundnut **oil** during heating at  
170.degree. C were studied over 6 h. Samples were analysed after 15, 30,  
60, 90, 120, 180 and 360 min and results for physico-chemical  
characteristics, viscosity, fatty acid composition, and formation of  
geometrical and **trans** isomers and polymers are shown graphically  
and in tables. Methods used included official methods of analysis for fats  
and oils, Ostwald's viscosimeter, GLC, gel permeation chromatography and  
UV spectrophotometry. The following results were obtained: gradual rise of  
acid number; increased peroxide number only after 6 h; gradual slow fall  
in I number (from 97.6 to 91.8); continuous rise in refractive index and  
viscosity (related to polymerization phenomena); fall in linoleic acid  
(from 26 to 20%), with concomitant rise in oleic acid and saturated fatty  
acids, elaidic acid and C18:2 geometric isomer; and formation of dimers,  
hydroperoxides, **free** fatty acids, and of trimers (after 90 min).

CC N (Fats, Oils and Margarine)

CT GROUNDNUT OILS; HEATING; COMPOSITION # HEATED

L6 ANSWER 58 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1981(02):N0052 FSTA

TI A two-dimensional (absorption-partition) thin-layer chromatographic procedure for the separation of fatty esters via their mercuric adducts.  
AU El-Zeany, B. A.; Abdel-Kader, S. Ahmed  
CS Dep. of Analytical Chem., Cairo Univ., Cairo, Egypt  
SO Egyptian Journal of Food Science, (1977, publ. 1979), 5 (1/2) 1-7, 13 ref.  
DT Journal  
LA English  
SL Arabic

AB The polyunsaturated esters of cod liver oil were prepared and fractionated with urea to obtain the unsaturated fraction ('methyl esters'). The cottonseed oil triglycerides were obtained free of unsaponifiable substances by elution through a column of silicic acid first with petroleum ether and then with benzene. In both cases the mercuration was done by allowing the methyl esters or triglycerides to react with a methanolic mercuric acetate reagent. The 2-dimensional method requires the decomposition of mercuric adducts of unsaturated esters on a silica gel G-kieselguhr plate in an H.sub.2S atmosphere after their fractionation freeing the compound for subsequent identification by partition chromatography. The partition is carried out on plates of the same composition as those used for adsorption after impregnation with paraffin. The separation of the mercurated methyl esters of cod liver oil yielded fractions for monoenes, dienes, trienes, tetraenes, pentaenes and hexaenes. Whereas argentation TLC of cottonseed oil triglycerides yielded 9 bands, TLC of their mercuric adducts yielded only 8 bands. The ability of the former method to differentiate between cis- and trans-isomers may account for the increased number of separated bands.

CC N (Fats, Oils and Margarine)

CT COD; FATTY ACIDS; OILS FISH; SEPARATION; THIN LAYER CHROMATOGRAPHY; COD LIVER OILS

L6 ANSWER 59 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1980(10):N0439 FSTA

TI Influence of techniques on the quality of food products in the fat and oil industry.

AU Helme, J. P.

CS Lesieur-Cotelle & Ass., 122 Avenue du General Leclerc, 92103 Boulogne, France

SO Revue Francaise des Corps Gras, (1980), 27 (3) 121-130, 24 ref.

DT Journal

LA English

SL German; French; Spanish

AB This lecture discusses the quality standards for edible fats with reference to consumer expectations, medical recommendations and legal requirements, and the effects of processing. While simple refining removes substances which may interfere with the hot or cold performance of fats (phospholipids, free fatty acids, soaps, metal traces, pigments, waxes, volatile flavour compounds) as well as some contaminants (aflatoxins, pesticide residues), it does not affect the polyunsaturated:saturated fatty acids ratio. Technological processes may introduce some changes, e.g. production of artefacts (isomers), mainly during decoloration (conjugated fatty acids), deodorization (destruction of tocopherols, formation of geometric isomers of linolenic acid), hydrogenation (trans isomers), and contamination by other fats. No artefacts are produced during interesterification and fractionation. In the last 2 yr, the contamination by PVC monomers from packaging material has been reduced to .ltoreq.10 parts/billion. While there has been a steady improvement in processing techniques, it is not yet possible to remove all oxidation products which may affect quality (e.g. shelf life), completely prevent the contamination of one fat by another or the formation of trans acids.

CC N (Fats, Oils and Margarine)

CT CONTAMINATION; FATS; FATTY ACIDS; REFINING; QUALITY REQUIREMENTS; RATIOS

L6 ANSWER 60 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1980(10):N0427 FSTA

TI [Isomeric forms of unsaturated fatty acids in dietary fats.]  
Untersuchungen ueber isomere Formen von ungesaettigten Fettsaeuren in  
Nahrungsfetten.

AU Yoon, Y. C.

CS Giessen, Federal Republic of Germany; Justus-Liebig-Univ.

SO (1979), 74pp., many ref.

DT Dissertation

LA German

AB A method for identification and detn. of unsaturated fatty acid isomers in  
fats is described, based on GLC on a FFAP-packed capillary column, and  
identification by MS. This technique was used in studies on the presence  
and concn. of isomers of octadecenoic acid and octadecadienoic acid in  
various types of **margarine** (standard, dietetic, 'health food',  
'all-vegetable **oil**' and bakery margarines), butter, frying fats  
of vegetable origin, and vegetable oils. Tables of data are given showing  
concn. of cis-9-octadecenoic acid (oleic acid), **trans**  
-9-octadecenoic acid (elaidic acid) and other octadecenoic acid isomers,  
9-cis,12-cis-octadecadienoic acid (linoleic acid) and other  
octadecadienoic acid isomers in the fats studied. The results are  
discussed in detail, with special reference to differences in isomeric  
fatty acid compositions of the fats studied. All classes of  
**margarine** included samples **free** from individual isomers.  
Overall, margarines varied considerably in concn. of the isomers studied,  
considerable levels of isomers other than oleic and linoleic acids being  
detected in many. Even dietetic margarines were not **free** from  
isomers other than oleic and linoleic acids. Results for frying fats were  
similar to those for margarines. Contents of oleic and linoleic acid  
isomers in butter varied seasonally (being higher in the summer than the  
winter, probably as a result of differences in diet), and were generally  
lower than contents of these isomers in margarines other than dietetic or  
'health food' types. Edible oils contained only traces of isomers of oleic  
and linoleic acids.

CC N (Fats, Oils and Margarine)

CT BUTTER; FATS; FATS VEGETABLE; FATTY ACIDS; FRYING; GAS CHROMATOGRAPHY;  
ISOMERS; MARGARINES; MASS SPECTROSCOPY; OILS; OILS VEGETABLE; FRYING FATS;  
GAS LIQUID CHROMATOGRAPHY; GLC; GLC-MS; **MARGARINE**; MASS  
SPECTROMETRY; MS; UNSATURATED; UNSATURATED # GLC-MS; VEGETABLE; VEGETABLE  
FRYING FATS; VEGETABLE OILS

L6 ANSWER 61 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1980(07):N0341 FSTA

TI [Hydrogenation of practically erucic acid-free rapeseed **oil**.]

AU Prepostffy, M.; Barany, M.

CS Noevenyolaj-es Mososzeripari Kutatointezet, H-1106 Budapest, Maglodi u.6.,  
Hungary

SO Olaj Szappan Kozmetika, (1979), 28 (3) 68-74, 7 ref.

DT Journal

LA Hungarian

SL German; Russian

AB The (i) practically erucic acid-**free** rapeseed **oil** can  
be hydrogenated in the same way as (ii) the traditional 50% erucic  
acid-containing rapeseed **oil**, except in the former the process  
should be modified according to its different fatty acid composition. In  
(i), the chain lengths of the fatty acid components of the triglycerides  
differ from those of (ii), 90% of the fatty acids having C18 instead of  
C20 or C22. As regards the amount of multiple unsaturated fatty acids, (i)  
is between (ii) and soybean **oil**. Furthermore, in the small  
amount of erucic acid containing oils, the isomerization of the

unsaturated fatty acids is greater. The **trans** isomer content of (ii) is 51-62, whereas that of (i) is 55-64%; amounts of total saturated fatty acids are 12-16% and 17-22%, resp. During hydrogenation in the case of erucic acid-free rapeseed fat of 28.degree. C 'slip point', the stearic acid production is faster than in traditional rapeseed fat. In the case of traditional rapeseed fat of 27.degree. C 'slip point', the increase of stearic acid is 1%, whereas that of 29.6.degree. C 'slip point' is 2.5-4.3%. Also in the erucic acid-free rapeseed fat, the **trans** isomer fatty acid content is 64-73% and the C18:1 fatty acid content is 69-78%, therefore it consists of relatively more homogenous triglycerides, than the traditional product. If the new **oil** is used in the production of **margarine** and cooking fat, the hydrogenation process should be modified according to the crystallization properties of the desired product.

CC N (Fats, Oils and Margarine)

CT FATS; FATTY ACIDS; HYDROGENATION; MARGARINES; RAPESEED OILS; COOKING FATS; ERUCIC ACID; **MARGARINE**

L6 ANSWER 62 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1979(04):N0136 FSTA

TI Trans-isomeric fatty acids present in West German margarines, shortenings, frying and cooking fats.

AU Heckers, H.; Melcher, F. W.

CS Dep. of Internal Med., Justus Liebig Univ. Giessen, Klinikstrasse 36, D-6300 Giessen, Federal Republic of Germany

SO American Journal of Clinical Nutrition, (1978), 31 (6) 1041-1049, 23 ref.

DT Journal

LA English

AB Fatty acid patterns were determined in 83 brands of **margarine**, 9 brands of low-calorie **margarine** and 18 brands of shortening, frying and cooking fat purchased at random from the retail market in the Federal Republic of Germany in 1973/1974, and again in 1976. Results are fully tabulated. GLC analyses on a Silar 10C coated packed column, complemented in some cases by the values recorded on a highly selective SP 2340 capillary column, showed **trans**-octadecenoic acids contents ranging from 53.2 to 0.1%. None of the products examined was completely **free** of **trans**-fatty acids. High values of **trans**-octadecenoate were always accompanied by positional isomers of **cis**-octadecenoate, by 9**trans**, 12**trans**-octadecadienoate and by 9**cis**, 12**trans**-octadecadienoate and 9**trans**, 12**cis**-octadecadienoate. Furthermore, 2 mixed geometric isomers derived from linolenic acid (probably 9**cis**, 12**cis**, 15**trans**-octadecatrienoate and 9**trans**, 12**cis**, 15**cis**-octadecatrienoate) could be identified, provided that the individual brand contained sufficient linolenic acid. Following partial hydrogenation, **trans**-hexadecenoate, 0.1-0.2%, was detected in some of the edible fats.

CC N (Fats, Oils and Margarine)

CT CALORIES; COOKING; DIETETIC FOODS; FATS; FATTY ACIDS; FRYING; MARGARINES; SHORTENINGS; COMPOSITION; COOKING FATS; LOW; **MARGARINE**

L6 ANSWER 63 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1978(09):N0442 FSTA

TI [Changes in rapeseed **oil** under different heating conditions.]

AU Kasperek, M.; Leszkiewicz, B.

SO Zeszyty Naukowe, Akademia Ekonomiczna w Poznaniu, (1976), Seria I, Prace z Zakresu Towaroznawstwa i Chemii No. 69, 32-38, 9 ref.

DT Journal

LA Polish

SL Russian; English

AB **Oil** samples were heated at 130, 150, 180, 200 and 250.degree.C for 8 h; peroxide number was determined, thiobarbituric acid test was carried out, and **free** fatty acids, n D light refraction coeff.,

viscosity (Rheotest 2 at 40.degree.C), composition of fatty acids (GLC) and content of isomers of **trans**-fatty acids were determined. Heating at 150.degree.C was found to have positive effects; at higher temp. polymers and **trans**-isomers, detrimental to health, were formed and adverse changes in composition of the fatty acids occurred.

CC N (Fats, Oils and Margarine)

CT FATTY ACIDS; HEATING; RAPESEED OILS; HEATED

L6 ANSWER 64 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1977(12):N0606 FSTA

TI [Research on selective hydrogenation by homogeneous catalysis. IV. Hydrogenation of soya **oil** by dicobaltoctacarbonyl.]

AU Cecchi, G.; Ucciani, E.

CS Lab. Nat. des Matieres Grasses (ITERG), Univ. d'Aix-Marseille, 13331 Marseille Cedex 3, France

SO Revue Francaise des Corps Gras, (1977), 24 (6) 321-326, 12 ref.

DT Journal

LA French

SL German; English; Spanish

AB Previously described methods [see FSTA (1972) 4 12N603] were used to study the hydrogenation of various products from the same soybean **oil** (esters, glycerides, neutralized and non-neutralized **oil**, hydrated raw **oil** with 0.6-4.8% **free** fatty acids) by Co.sub.2(CO).sub.8. The study was intended to show the qualitative effect of some minor components on the specific activity, selectivity, and suitability of the catalyst for isomerization. The rate of hydrogenation was not affected by the glyceride structure, slightly reduced by unsaponifiables and by >2.5% of **free** fatty acids; phospholipids affected only the rate of cis-**trans** isomerization. An optimization study determined the effect of 4 basic parameters on the hydrogenation of a raw acid **oil** (pressure, time, temp., Co concn.). Unlike in the case of esters, the Co concn. had a significant effect. Hydrogenation at 120.degree.C, 32 bar, 0.67 g Co/100 g for 203 min allowed a reduction of linolenic acid to <2%, but entailed an increase in **trans**-isomers to about 30% and formation of 3% conjugated dienes. The catalyst was recovered by a 5% excess of H.sub.2SO.sub.4 (2N for 1 h or N for 2 h at 80.degree.C). Centrifugation washing reduced residual Co concn. to <0.5 ppm. While the Co catalyst was considerably less active than Ni or Cu, hydrogenation could be done at 50-80.degree.C. [See FSTA (1975) 7 6N251 for part III.]

CC N (Fats, Oils and Margarine)

CT CATALYSTS; HYDROGENATION; SOYBEAN OILS

L6 ANSWER 65 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1976(07):N0315 FSTA

TI Homogeneous selective catalytic hydrogenation of soybean **oil**.

AU Fedeli, E.; Jacini, G.

CS Exp. Sta. for Fats & Oils, Nat. Cent. for Lipochemistry of the NCR, Milan, Italy

SO Fette, Seifen, Anstrichmittel, (1976), 78 (1) 30-34, 23 ref.

DT Journal

LA English

SL German

AB Chelates derived from the Schiff bases of the 2,2-dialkyl propylene-1,3 diamine with salicylaldehyde have been used as homogeneous catalysts, in the hydrogenation of soybean **oil**. Cu, Fe, Co, Ni, Pd chelates were tested and different catalytic trends observed. The most active catalysts were the copper chelates. A marked reduction of trienes to give mostly monoenes accompanied by no marked increase of conjugated dienes or **trans** double bonds was observed in some of the hydrogenation experiments. Selectivity values have been calculated; the iron catalysts showed the highest selectivity values but their catalytic activities were

usually lower than that of the copper chelates. None of the catalysts were active at <100 atm., <60.degree.C and <3% concn., catalysts did not undergo decomposition during hydrogenation and could be recovered from the oils by chromatography on silicic acid columns. No traces of **free** metals were found in recovered chelates. Catalytic activity was not dependent on the chelate side chains.

CC N (Fats, Oils and Margarine)

CT ADDITIVES; CATALYSTS; HYDROGENATION; SOYBEAN OILS; CHELATING AGENTS

L6 ANSWER 66 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1976(07):N0309 FSTA

TI [Thermal reaction of safflower **oil** in the presence of magnesium iodide (MgI.sub.2).]

AU Shiina, H.; Hashimoto, T.

CS Nat. Chem. Lab. for Ind. 1-1, Honmachi, Shibuya-ku Tokyo, Japan

SO Journal of Japan Oil Chemists' Society [Yukagaku], (1975), 24 (12) 851-855, 8 ref.

DT Journal

LA Japanese

SL English

AB Safflower **oil** was heated at 140-220.degree.C in the presence of 1-5% MgI.sub.2 and the fatty acid composition of the reaction products determined by GLC and UV spectrophotometry. Extensive isomerization took place at high temp. and high catalyst concn. The amount of conjugated diene formed went through a max. At the same time large amounts of a substance with the same retention time as methyl oleate were formed (max. 52.3% at 160.degree.C for 4 h 5% MgI.sub.2), identified by GLC, GC-MS and oxidative ozonolysis as a mixture of positional isomers of octadecenoic acid with mainly **trans** double bonds. Products of side reactions (decomposition, polymerization, etc.) included 9 (o-propyl phenyl) nonanoic acid, 8-phenyl octanoic acid, alkyl iodides, alkyl benzenes and n-alkanes, which were also formed in thermal reaction with I, suggesting that **free** I liberated from MgI.sub.2 during heating was the main catalyst.

CC N (Fats, Oils and Margarine)

CT CATALYSTS; HEATING; MAGNESIUM; OILS VEGETABLE; MGI2 THERMAL REACTION; SAFFLOWER OILS

L6 ANSWER 67 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1976(01):N0054 FSTA

TI Selective hydrogenation of soybean **oil**. VII. Poisons and inhibitors for copper catalysts.

AU Koritala, S.

CS North Regional Res. Lab., Peoria, Illinois 61604, USA

SO Journal of the American Oil Chemists' Society, (1975), 52 (7) 240-243, 17 ref.

DT Conference

LA English

AB Hydrogenation rates for the catalytic reduction of soybean **oil** with a copper-on-silica catalyst increased when the **oil** was re-refined and bleached in the laboratory. Purification of the re-refined and bleached **oil** by passage through alumina further enhanced hydrogenation rates. Since these observations suggested that poisons were present in the **oil**, the effect of minor components of soybean **oil** upon the activity of Cu catalysts was investigated. **Free** fatty acids, monoglycerides, .beta.-carotene, phosphoric acid, sodium soaps, phosphatides, glycerine, choline, ethanolamine, water, phaeophytin, and pyrrole all reduced hydrogenation rates when added to the **oil**. Organic S added to the **oil** was a more effective catalyst inhibitor than organic S added to the gas. Catalyst activity was affected adversely when Fe was added to the **oil** as a soap or when deposited on the catalyst during its preparation. Squalene, Cu soaps,

and carbon monoxide had no influence on the activity of the catalyst. Ageing of soybean oil also had no effect. There was no significant change in either selectivity or formation of **trans** or conjugated diene isomer when these additives were added to the oil. [See FSTA (1972) 4 7N341 for part VI.]

CC N (Fats, Oils and Margarine)

CT HYDROGENATION; SOYBEAN OILS; SELECTIVE

L6 ANSWER 68 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1976(01):N0050 FSTA

TI Identification of volatile flavor compounds developed during storage of a deodorized hydrogenated soybean oil.

AU Yasuda, K.; Peterson, R. J.; Chang, S. S.

CS Dep. of Food Sci., Rutgers State Univ., New Brunswick, New Jersey 08903, USA

SO Journal of the American Oil Chemists' Society, (1975), 52 (8) 307-311, 9 ref.

DT Journal

LA English

AB The volatile compounds from soybean oil (hydrogenated to I value 58.5; 51.5% **trans** isomers; **free** of antioxidant), which had been aged at 85.degree.C for 3 wk to develop an objectionable hydrogenation flavour, were studied. Steam-distilled non-acidic volatiles were fractionated by gas chromatography and fractions identified by IR and mass spectrometry. 48 compounds were identified from the material having the characteristic odour. 6-**trans**-nonenal, 2-**trans**-6-**trans**-octadienal and higher alcohols and lactones were considered to be the contributors to the hydrogenation flavour.

CC N (Fats, Oils and Margarine)

CT FLAVOUR COMPOUNDS; SOYBEAN OILS; STORAGE; VOLATILE COMPOUNDS; VOLATILE # STORED DEODORIZED HYDROGENATED

L6 ANSWER 69 OF 73 FSTA COPYRIGHT 2002 IFIS

AN 1974(09):N0441 FSTA

TI [Method of converting sterols contained in vegetable and animals fats into their fatty acid esters.]

Verfahren zur Umwandlung von Sterinen in ihre Fettsaeureester, enthalten in pflanzlichen und tierischen Fetten.

IN Baltes, J.; Merkle, R.

PA Harburger Oelwerke Brinckmann & Mergell

SO German Federal Republic Patent Application, (1974)

PI DE 2248921

DT Patent

LA German

AB **Free** sterols in animal and vegetable fats and oils, used for producing solid (hydrogenated) fats such as cooking fat, shortening and **margarine**, are **trans**-esterified in a homogeneous phase at high temp. (e.g. 120.degree.C) in the presence of alkali alcoholates or alkali metals as catalysts (e.g. sodium methylate), by adding to the fats or oils 1.0-1.1 parts (based on **free** sterol content) fatty esters of monovalent, C.sub.1.sub.-.sub.4 aliphatic alcohols, obtained by alcoholysis of oils or fats, or by esterification of fatty acids with methanol, ethanol, propanol or butanol. The mixture is subjected to **trans**-esterification conditions while removing the monovalent alcohols which are released. The product is practically **free** from partial glycerides, particularly diglycerides, the esters obtained are stable, and the sterols are thus prevented from modification, particularly by oxidation.

CC N (Fats, Oils and Margarine)

CT ESTERIFICATION; FATS; FATS ANIMAL; FATS VEGETABLE; PATENTS; STEROIDS; STEROLS; ANIMAL; ANIMAL FATS; FATS (ANIMAL); FATS (VEGETABLE); PATENT; TRANSESTERIFICATION; VEGETABLE; VEGETABLE FATS

L6 ANSWER 70 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1973(11):T0578 FSTA  
TI [Study of cumin (*Cuminum cyminum* L.) seed and its essential oil and glycerides.]  
AU Georgiev, E. V.; Khadzhiiski, Ts. T.; van Khong T'm  
CS Vissh Inst. po Khranitelna i Vkusova Promishlenost, Plovdiv, Bulgaria  
SO Nauchni Trudove, Vissh Institut po Khranitelna i Vkusova Promyshlennost, (1971), 18 (3) 259-270, 36 ref.  
DT Journal  
LA Bulgarian  
SL Russian; French  
AB Analytical data tabulated for seeds of (i) variety scabridum and (ii) variety setosum of cumin from 1966, 1967 and 1968 crops include the overall values or ranges given below. (i) and (ii) respectively contained 2.8-5.7 and 2.6-4.7% essential oil, 15.7-21.6 and 12.3-21.9% triglyceride oil, 9.2-9.5 and 8.6-9.7% ash, 8.5-13.2 and 8.8-14.5% cellulose, 19.5-24.2 and 14.9-25.0% crude protein, and 32.8-37.7 and 33.8-42.7% N-free extractives. The essential oils of (i) and (ii) contained as main components cuminal (53.3-53.9 and 51.0-62.6%), p-cymene (14.2-15.1 and 12.8-13.8%), .beta.-pinene (9.7-10.7 and 8.8-11.2%), and .gamma.-terpinene and 1.8-cineol (9.5-13.0 and 6.0-15.5%) and small quantities of .alpha.-pinene, trans-sabinene hydrate, .alpha.-terpineol and caryophyllin. The triglyceride oil consisted mainly of C.sub.1.sub.8.sub.:.sub.1 (63.3 and 61.8%) and C.sub.1.sub.8.sub.:.sub.2 (31.6 and 32.2%).  
CC T (Additives, Spices and Condiments)  
CT SPICES; COMPOSITION # ITS PRODUCTS; CUMIN

L6 ANSWER 71 OF 73 FSTA COPYRIGHT 2002 IFIS  
AN 1973(03):N0130 FSTA  
TI 2-trans,4-cis,7-cis-decatrienal, the fishy off-flavour occurring in strongly autoxidized oils containing linolenic acid or .omega.3,6,9,etc., fatty acids.  
AU Meijboom, P. W.; Stronk, J. B. A.  
CS Unilever Res., Vlaardingen, The Netherlands  
SO Journal of the American Oil Chemists' Society, (1972), 49 (10) 555-558, 38 ref.  
DT Journal  
LA English  
AB A possible decomposition product of oils containing unsaturated fatty acids with the double bond pattern .omega.3,6,9 or .omega.3,6,9, etc., is 2-trans,4-cis,7-cis-decatrienal. It has therefore been investigated whether this trienal is present in strongly autoxidized linolenic acid, soybean, linseed and fish oils. Via a degassing technique the carbonyls from the samples of oils heated in a closed system under nitrogen were collected and separated as their 2,4-dinitrophenyl-hydrazones (DNPHs) by thin layer chromatography (TLC). The presence of 2-trans,4-cis,7-cis-decatrienal in the samples was positively established by TLC, UV absorption and mass spectroscopy of its DNPH. All analytical data established the complete identity of the isolated DNPH with a synthesized 2,4,7-decatrienal-DNPH. The free aldehyde obtained on hydrolysis of the alkatrienal-DNPH in question had the same flavor as authentic 2-trans,4-cis,7-cis-decatrienal, having a fish or rather a whale oil flavor.  
CC N (Fats, Oils and Margarine)  
CT ALDEHYDES; FISH; FLAVOUR; LINOLENIC ACID; OILS; OXIDATION; 2-TRANS,4-CIS,7-CIS-DECATRIENAL; AUTOXIDATION; AUTOXIDIZED; FISH OIL; LINSEED OIL; OFF-FLAVOUR; OIL; OILS (FISH); SOYBEAN OIL

L6 ANSWER 72 OF 73 FSTA COPYRIGHT 2002 IFIS